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STEEL
ESTABLISHED 1882

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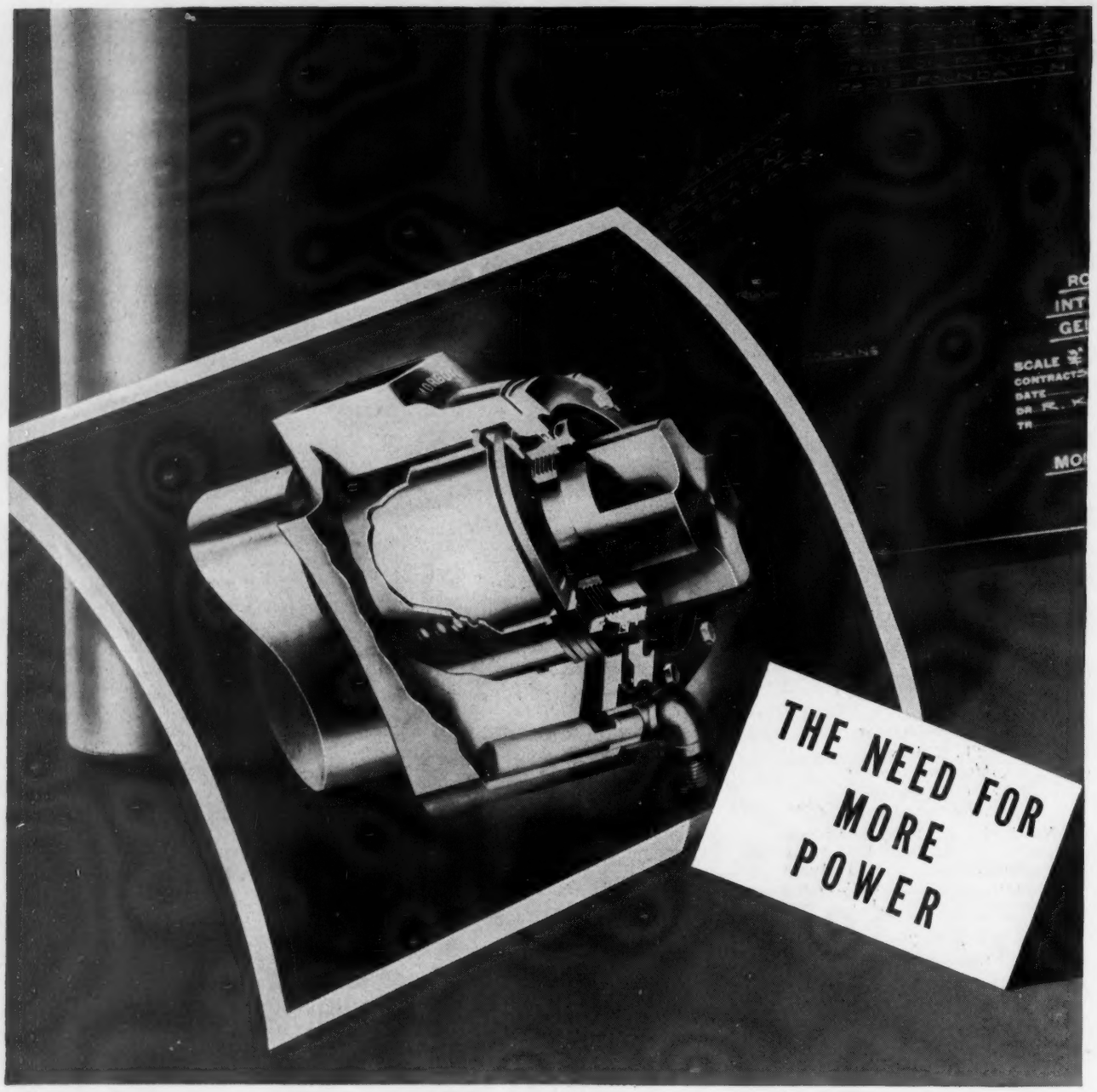

This problem will be answered in part by reducing power losses. For instance, Morgoil Roll Neck Bearings, replacing old-type babbitt and bronze bearings, have reduced the kilowatt hours per ton by as much as 50%. . . . Perhaps there is something we can do for you—we'll be glad to try.

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HIGHLIGHTING
THIS ISSUE OF
STEEL

■ MACHINE tool builders meeting in Chicago last week **(p. 21)** urged the government to clarify its labor policies, while 8000 employes went out on strike **(p. 23)** at Great Lakes Steel, Detroit, and the Chicago situation continued tense. . . . America's mass mind must be awakened to fuller appreciation of our free institutions and the crises confronting them **(p. 27)** if defense is to be successful, according to E. L. Shaner, editor-in-chief, STEEL. . . . Important questions relating to defense were discussed at the "Triple Mill" convention **(p. 28)** and the meeting of structural steel fabricators **(p. 26)**. . . . Priorities division served notice it will insist on strict compliance with its regulations by taking punitive action **(p. 37)** against diversion of aluminum to nonessential uses.

• • •

Why There's No Dancing

"Why is there no dancing in the streets to celebrate the tremendous gains in industrial production?" Leon Henderson asked a Detroit audience. The answer, as pointed out in Mirrors of Motordom **(p. 37)**, is three-fold: Problems—headaches—with labor, materials and priorities. . . . Wing Tips **(p. 40)** continuing its narration of developments at Wright Field deals with designing and producing military planes. . . . Canadian government's war-time wage act **(p. 47)** appears to be blunting the fangs of labor agitators. . . . Vincent Delport, STEEL'S European editor stationed at London, **(p. 49)** reports steel demand in Great Britain has diminished, with civilian products curtailed and armament plants unable to use potential output.

• • •

"25% Cut in 1942 Building"

Pressure for materials will cause a 25 per cent reduction **(p. 51)** in new construction in 1942 under 1941, according to OPM statisticians. An even greater share of new building next year will be for direct defense purposes. . . . The nation's railroads will be taxed severely to move the peak autumnal freight during the next few weeks, a National Association of Manufacturers survey **(p. 51)** indicates. The shortage, however, may be only temporary. . . . OPM's Priorities Division and Contract Distribution Division have opened more field offices **(p. 34)** to aid manufacturers convert nondefense facilities to defense production and to obtain raw materials. . . . Steelworks and foundries who are able to import iron and steel scrap from foreign countries may pay more than the established maximum prices for such material **(p. 34)**.

• • •

Johnson Rifle Is Described

An analysis of the Johnson semiautomatic rifle is presented **(p. 58)** this week by Professor Macconochie. Action of the bolt and other parts is explained . . . . S. M. Jenkins tells about "streamlining" furnaces **(p. 70)** with insulation and steel construction. . . . One company speeds construction of aircraft accessories **(p. 76)** by welding tubes to make simple sturdy units. . . . New Westinghouse setup at Cleveland Lighting Division utilizes "matching" centers **(p. 82)** to provide stopover points for intermittent production sequences more than doubling plant output with only 40 per cent additional floor space. System has important possibilities.

• • •

Protecting Machine Tools

Guy Hubbard, STEEL'S machine tool editor, points out **(p. 56)** the necessity of carefully protecting ways, slides and other guiding surfaces of machine tools since accuracy of the work done depends so completely upon these elements of the machine tool. Also he outlines what machine tool manufacturers are doing to protect these elements and what the shop man can do. . . . A discussion of several of the more important factors that affect structure and grain size of electrodeposited copper is presented **(p. 64)**. . . . Instruction material to cover practically every factor connected with use of tungsten carbide tools is now available **(p. 62)**.

Mr. Charles Brinley, President of the Baldwin Locomotive Works speaking at ceremonies when Baldwin's first M-3 tank was turned over to the Army.

Ryerson Service Helps Baldwin Save Time on Tank Schedule

● Baldwin needed steel *immediately* for a model tank to be constructed quickly as a guide to future production. *Speed* was the important factor, so Baldwin turned to Ryerson stocks for immediate shipment of the necessary steel. Ryerson alloy and carbon steels were shipped from stock the same day permitting work to begin at once.

Through this quick cooperation and the help of many other suppliers, Baldwin was able to beat the official schedule. This illustration is typical of the service Ryerson is rendering daily to manufacturers working on the National Defense Program.

Thousands of emergency calls have cut down our large stocks of steel, however, we are still serving thousands of customers in accordance with the OPM plan and believe we will be able to continue this service even if on a restricted basis, for the duration of our national emergency.

Joseph T. Ryerson & Son, Inc., Chicago, Milwaukee, St. Louis, Detroit, Cincinnati, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON *Certified* **STEELS**

RYERSON CERTIFIED STEELS

Tool Builders Petition Government To "Strengthen National Unity"

Ready to expand production by continuous operations seven days a week, as Knudsen suggests, but want administration to state publicly its labor policies

■ "WHEREAS the machine tool industry, conscious of its responsibility for serving the national defense, increased its production in 1940 from $225,000,000 of output to $425,000,000, and has pledged itself in 1941 to $750,000,000 of output, and so advised Mr. Knudsen in January, and

"Whereas this has been accomplished by an ever-growing volume of subcontracting of parts and complete machines, and by the training of men for second and third shift operation on the critical tools, to the point where more than a half of all its employes are now at work in plants operating on a three-shift basis, and

"Whereas Mr. Knudsen, in his letter of Oct. 8, still further asks us to increase wherever possible the man-hours on night shifts, to develop subcontracting to the greatest possible extent and to work critical tools seven days a week, therefore

"Be it resolved that we will expand to the fullest extent the day and night operation of those critical tools on which the output of our shops depends, and that we will continue with full diligence to expand the volume of our subcontracting of parts and complete machines of all the critical types, and that we will expand this critical production to the fullest possible extent by Sunday work; but, in view of the fact that in general none but those industries in which continuous operation is a physical necessity are now so working, and in view of the fact that attempts to operate seven days a week have met with the obstacles of state laws, and sincere religious conviction, therefore

"Be it further resolved that in view of this request, we in turn request of the national administration, that it give increasing attention in its public statements and its policies toward labor and the general public, to strengthening such a sense of national unity as will make it possible for us and for all other co-workers in the great undertaking to use our skill, experience, energy and ability to the limit, whether by seven-day operation or by any other practical means whatsoever.

"The machine tool builders of the United States will do their duty."—*Resolutions adopted by Machine Tool Builders Association.*

How Employment and Companies Have Increased, Work Subcontracted

CHICAGO

■ FORTIETH annual convention of the National Machine Tool Builders Association in Edgewater Beach hotel here, Oct. 13-14, drew an attendance of more than 260. In addition to a record attendance from the older machine tool centers in the East and Middle West, builders from the Pacific coast were present.

In an address, "Machine Tools Meet the Emergency," Frederick V. Geier, president, Cincinnati Milling Machine Co., and retiring president of the association, commented upon the demand for greater effort. He pointed out two years ago 110 companies having 90 per cent of the industry's workers employed 44,000 persons. Employment increased to 68,000 by September, 1940, and to 92,000 in September, 1941. In the meantime, teaching new workers was pushed rapidly, and at present more than 12,000 are in training.

In view of some criticism of the industry because of alleged failure to take full advantage of overtime and multiple shifts, it is significant that average hours worked in machine tool plants actually are the highest in American industry. According to the National Industrial Conference Board, 99.12 per cent of employes in the industry are in plants operating either two or three shifts. Eighty-seven per cent of the plants are operating from 100 to 168 hours per week.

Subcontracting rapidly is growing in effectiveness, said Mr. Geier. Eighty-nine companies now are "farming out" parts, subassemblies and complete machine tools to the extent of more than 25,000,000 man-hours per year. That "it can be done" in the case of complete machines is attested by the fact that

36 machine tool companies actually are doing it with 56 different kinds of machines.

The emergency has brought new machine tool building organizations into the picture. Mr. Geier stated that in five important machine tool groups, there now are—in addition to 54 "old-line" builders—45 new companies. Throughout the industry as a whole he estimates that there are at least 72 new builders.

Two speakers from Washington gave straight-from-the-shoulder talks on the status of the machine tool industry in relation to the rapidly growing defense program. One was Mason Britton, chief of tools section, Office of Production Management.

"We are in the war," said Mr. Britton, "and it is a war in which the dictators must constantly have new food, new tools and new slaves. When they can get no more they will collapse."

Recognizing the present gravity of the situation, there is just one thing for us to do, he explained. That is to face the facts and begin immediately to operate under war economy. As far as the machine tool industry is concerned, Mr. Britton urged immediate bolstering of the generally weak second shift; more subcontracting; reduction in the number of sizes of machine tools; elimination of purely competitive selling features; and stripping of machine tools down to the bare essentials necessary for accuracy and high production.

Prompt Return of Reports Urged

Howard W. Dunbar, technical chief, tools section, OPM, emphasized the need for prompt and complete filling out and return of OPM report cards advising of shipments, etc. He told of the survey of the "critical machine tool" situation and of steps taken to develop new sources for tools that are scarce, such as big boring mills and planers.

Stirred by these addresses, Ralph E. Flanders, speaking for the industry, offered a resolution pledging the machine tool industry to unparalleled "all out" efforts—the keynote of this pledge being "The machine tool builders of the United States will do their duty!" This was adopted unanimously.

Speakers included Wendell E. Whipp, on new color standards for machine tools; Clayton R. Burt, on the work of the defense committee; William J. Kelly, on the Washington activities of Machinery and Allied Products Institute; Tell Berna, work of the association during the past year; and George H. Johnson, financial report.

At the close of the convention, Clifford S. Stilwell, executive vice president, Warner & Swasey Co., Cleveland, was introduced as the new president of the association for the coming year. In a few words, Mr. Stilwell made a strong plea for unity among Americans to give us strength against the foreign menace. "As far as the machine tool industry's part is concerned we are a long way from the top of this job," he said.

Clifford S. Stilwell
Elected president, National Machine Tool Builders' Association

Other new officers are: First vice president, George H. Johnson, president, Gisholt Machine Co., Madison, Wis.; second vice president, John S. Chafee, vice president, Brown & Sharpe Mfg. Co., Providence, R. I.; treasurer, E. C. Bullard, vice president, Bullard Co., Bridgeport, Conn. New directors are: John S. Chafee; E. Blakeney Gleason, vice president, Gleason Works, Rochester, N. Y.; and Albert H. Eggers, sales manager, Greenlee Bros. & Co., Rockford, Ill.

Tell Berna continues as general manager of the association, and Mrs. Frida F. Selbert as secretary. Richard H. Abbott has been added to the staff as assistant to the general manager.

Machinery Exports in August Up 50 Per Cent

■ Exports of industrial machinery in August reached the highest monthly value since January, $41,976,614, an increase of more than 50 per cent over $27,794,765 in July, according to the Department of Commerce. Gains in metalworking machinery and petroleum equipment were the principal factors.

Machine tool exports, which have been declining for the past three months, made a sharp recovery in August, $17,124,324, more than 85 per cent above the July total of $9,226,262. The increases affected every class of machine tools. Milling machine value was $4,151,690 against $2,034,603 in July. Lathes advanced from $1,730,327 in July to $3,554,183 and grinding machines from $1,168,936 to $2,399,030. Rolling mill equipment shipments in August were valued at $543,558, compared with $456,542 in July.

Mining, well and pumping equipment exports at $5,715,118 were almost twice those of July and power generating machinery at $3,081,224 gained 17 per cent over July.

Exhibit of Modern Abrasives Dedicated

■ The Carborundum Co.'s permanent education exhibit, depicting the story of modern abrasives, now open at the Chicago Museum of Science and Industry, was dedicated at a reception in Hotel Windermere, Chicago, Oct. 16.

Charles Knupfler, vice president in charge of sales, presented the exhibit on behalf of Carborundum's board of directors. Major Lennox Lohr accepted for the museum. Frank J. Tone, Carborundum president, was unable to be present because of illness of his son.

One hundred-fifty guests attended the reception and visited the museum.

Rainbow Bridge at Niagara To Open Soon

■ Rainbow Bridge at Niagara Falls, N. Y., a span of 950 feet and the largest hingeless steel-rib arch in the world, is scheduled to be opened to traffic this month. Consequently, unusual interest was manifested in a discussion of the bridge at a meeting of the Philadelphia section, American Society of Civil Engineers, last week.

Shortridge Hardesty, consulting engineer, New York, discussed the planning and design of the bridge, and E. L. Durkee, resident engineer, Bethlehem Steel Co., Bethlehem, Pa., the erection. Motion pictures showed various stages of construction. Lester L. Lessig, local contracting engineer, Bethlehem Steel Co., presided as chairman.

Described as a spectacular structure in a spectacular setting, the bridge, in addition to the main steel arch, includes high concrete approaches to cross the 1200 feet between the rims of the Niagara gorge. Few bridges in recent years, it was pointed out, presented so many unusual problems of planning and design, with erection requiring so many special methods. As falsework was impracticable because of water depths, elaborate cable tieback systems were employed.

■ Steel barrel and drum production, heavy types, in August amounted to 1,600,156 units, compared with 1,549,029 in July, according to the Bureau of the Census.

"Wildcat" Strike Cripples Great Lakes Steel; Chicago Still Tense

Two blast furnaces, 15 open hearths at Detroit banked as 8000 walk out, defying leaders . . . One thousand at Ford furnaces persuaded to return

DETROIT

■ TWO blast furnaces and 15 active open hearth furnaces at Great Lakes Steel were banked last Friday because of a strike. The steelmaking rate in this district for the week dropped to 68 per cent, off 23 points.

Eight thousand men were out of work and picket lines were around all divisions of the plant. The company was powerless to remedy the situation because successful wage negotiations had been concluded with union officials, but apparently a few hundred of the rank and file decided increases were not sufficient and walked out, the fourth "wildcat" affair since June, but the first to suspend both blast furnaces and open hearths.

Loss in production for last week was about 13,500 tons of steel ingots—sufficient steel for over 400 medium tanks or a month's full-rate production at the Chrysler tank arsenal. Apparently even a few days' continuation of this serious interruption to production of defense steel will bring immediate steps from government or military officials. Great Lakes production has been averaging about 60 per cent for defense needs.

Nearly 1000 workmen employed in the blast furnaces and by-product coke works of Ford Motor Co. at River Rouge walked out last Thursday morning, stating they are not receiving wages "equal to the highest paid in competitive plants," as provided by the Ford-UAW contract. They were persuaded to return a few hours later by union officers who promised their grievances will be taken to an appeal board as provided by the contract.

Finished Steel Loss in Chicago Estimated at 30,000 Tons

CHICAGO

■ ALTHOUGH the labor situation at Chicago district plants of the Carnegie-Illinois Steel Corp. continued tense during last week and some work stoppages occurred, by week-end the strain had eased considerably and comparative quiet prevailed. Developments indicated, however, that a showdown in the SWOC-CIO drive for the closed shop has merely been delayed, with new difficulties likely to arise before Nov. 1.

A petition to the United States courts by an independent group for reinstatement of a restraining order of last March forbidding mass picketing and interference with workers, subsequently withdrawn at the hearing, was the factor responsible for delay in the drive. It also appeared to exert a sobering influence. The petition was filed on the eve of announced mass picketing and dues inspection at the corporation's steelworks and sheet and tin mill in Gary, Ind.

Steelmaking operations in the Chicago district last week were at 101 per cent of capacity, compared with the revised rate of 90.5 per cent for the preceding week, when interruptions due to the closed shop drive forced suspension in production. The rise of 11 points lifted the rate to within ½-point of the prestrike level. Another flare-up over the Oct. 11-12 weekend—this time at the South Chicago, Ill., steelworks of Carnegie-Illinois—reduced the rate for the week ended Oct. 11 by 1½ points from 92 to 90.5 per cent.

It is estimated that loss in steel ingot production in the various corporation plants here in the last two weeks has aggregated 38,000 tons. Loss in pig iron output, through retarding of blast furnaces, probably amounts to 27,000 tons. Loss of finished steel is estimated at 30,000 tons.

On Saturday, Oct. 11, a number of key men failed to report for work and the company was forced to retard 8 of 11 blast furnaces. This subsequently made it necessary for 23 of 46 open hearths to suspend temporarily over that week-end.

The sheet and tin mill at Gary also was closed down for a while Saturday of the same week when a general walkout occurred after several nonunion girl assorters managed to pass through picket lines and went to work. Later in the day, operations were restored to between 50 and 60 per cent of capacity.

Gary and South Chicago plants were operating at full capacity Monday, Oct. 13, while the union presented grievances to the Carnegie-Illinois management. All pickets were removed. Company's position, it was understood, was that dismissal of any employe merely because he is not a member of the union is out of the question.

However, trouble flared anew Monday at the Joliet, Ill., coke plant, when 99 CIO maintenance men refused to work with three nonunion men and three others in arrears in union dues. Later in the day all workmen returned to their posts without serious effect on operations. CIO leaders ordered the nonunionists to join the organization and those behind in dues to pay up by Oct. 22, or quit their jobs.

Meanwhile, AFL entered the pic-

ture, granted a charter to an independent group of workers at Gary, and proceeded to sign up members of the group and nonunionists. Leaders reported considerable progress.

In its drive for the closed shop, the CIO laid elaborate plans for extensive dues picketing to start early Wednesday morning at both the Gary steelworks, which was forced down two days the preceding week by an unauthorized strike, and the Gary sheet and tin mill.

Mass picketing was scheduled. The union announced also it would conduct dues inspections inside the plants, despite the fact Federal Judge Thomas W. Slick, South Bend, Ind., had ruled on March 31 that this procedure is contrary to the law and a violation of the rights of individual workers.

The CIO also exerted pressure for revocation of the CIO charter granted to workers not choosing to affiliate with the CIO. This went so far as mill workers being told to place notes in their milk bottles informing the milk drivers' union (AFL) they would stop taking milk unless the new charter were revoked.

Mass Picketing Plan Thwarted

Plans of the SWOC-CIO to force the closed shop through the Gary mass picketing, intended to exclude workers not members of the union, were suddenly thwarted late Tuesday afternoon when Attorney Harry Sharavsky, acting for an independent group, appeared before Judge Slick in South Bend, and petitioned the court for an injunction against interfering with workers.

The petitioning group is understood to be the Independent Steel Workers Bargaining and Benefit Association, which had applied for and was granted the AFL charter.

Although not granting the injunction immediately, Judge Slick communicated with Frank Grider, CIO organizer and subdistrict SWOC director in Gary, stating he would conduct a hearing on the petition Wednesday morning if the union promised there would be no violence at the mills prior to that time.

Grider promised there would be no clashes, nor any interference with any worker, union or nonunion, who might appear for work. On this basis, Judge Slick extended to the union the courtesy of being represented at the court hearing and to present any evidence it wished to offset that which might be presented by the petitioners.

At the hearing, Judge Slick conferred with Richard F. Kaplan, attorney for the SWOC, and Attorney Sharavsky and immediately afterward it was announced that the petition which sought to reinstate a restraining order entered by the judge last March 28 had been withdrawn. This order forbade mass picketing and assembling of more than ten pickets at any one point.

However, another sudden disturbance occurred in the Gary steelworks Wednesday evening, which resulted in 5 to 12 blast furnaces being retarded for a 10-hour period. At 10 p.m., nine men on an ore bridge sat down because one man was not a member of the CIO. In sympathy, 7 union men on the high line and 30 men in the sintering plant sat down. Refusing to work, these men were sent home by the management. The incident was over by midnight.

The CIO now states that the deadline for nonmembers to sign up has been extended from Oct. 22 to Nov. 1, and that further dues picketing is not contemplated until next Wednesday.

Grider says the union may resort to an inside dues inspection in its drive for a closed shop. This method, he asserts, involves CIO workmen asking fellow workers to show union cards, and if they fail to do so, the CIO members refusing to work with the non-CIO employes.

A complete tie-up of plant production could result from these tactics, observers point out.

CIO announced dues inspection picketing will be conducted at Inland Steel Co.'s plant in Indiana Harbor, Ind., starting with the midnight shift Thursday night, Oct. 23.

"Four Aces . . . and We Are Going To Take the Pot"

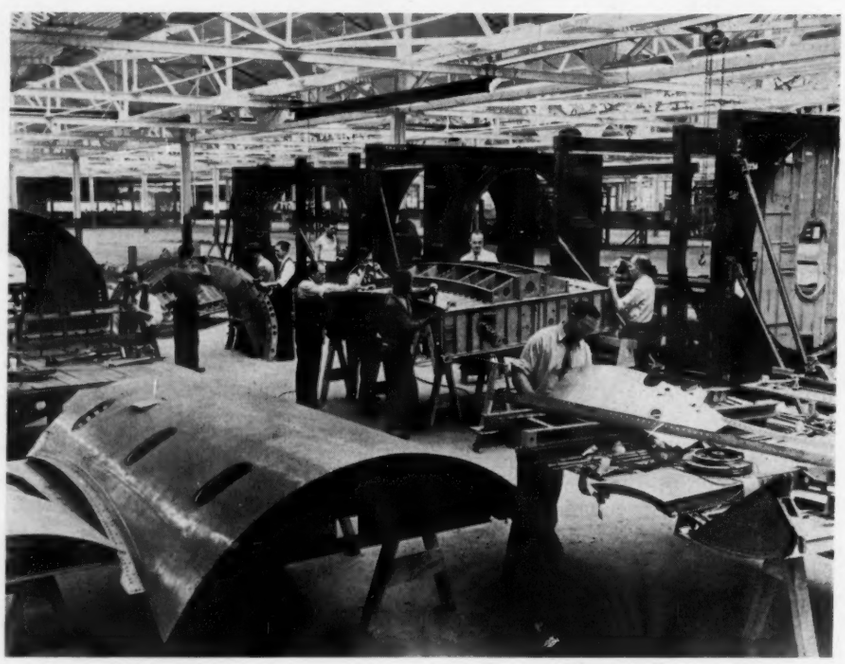
"This is one time that the Steel Workers' Organizing Committee has the cards and when we have four aces in our hand we are going to take the pot. We not only can do it now, but we will do it now."

The Gary Post Tribune thus quotes Van A. Bittner, regional director, in reporting his speech before "523 delegates from 52 lodges in the Calumet-Chicago area." Continuing, it quotes him as saying:

"One of the causes of trouble we are having here and there is that when the U. S. Steel Corp. signed a contract in 1936, it had never had any dealings with any except a company union and thought that it could get along on about that same basis. Also, there were many workers who thought they could continue to enjoy the benefits and privileges won for them by the SWOC, without belonging to the union.

"We have demonstrated to the U. S. Steel Corp. that this is no com-

Chrysler Foremen Learn Plane Building Techniques



■ **Actual assembly of the fuselage sections for the Martin medium bomber which Chrysler Corp. will produce in volume in its new aircraft plant at Detroit and of which the first is shown here, is included as an integral part of Chrysler's training program for men who will supervise the job. More than 200 will be given an 8-weeks' training course at the Chrysler unit, followed by several weeks at one of the Martin plants, after which they will return to Detroit to direct work. Each supervisor will thus have actually performed the operation he is to superintend, will have been trained in it, and will have worked at the job in an aircraft factory**

pany union and to these nonunion workers that if they want work, they must belong to the SWOC. I don't like to see strikes because people don't want to belong to a union; it hurts me when sometimes we have to stop work to show that steel can't be produced without us.

"The best way to get a union shop is not to depend on the steel corporation giving it to you but to take it yourselves.

"The day of the steel corporation giving to us is over. We are strong enough now to take what we want —and we want only what is good. Is anything wrong about men refusing to work with other men? I don't think so.

"Let us not spend our time waiting to see what the corporation and other steel companies will do about the union shop. Let's take it now . . .

"There are two great defense programs in this country—the government has one on and we have one on. We look at it realistically, believing that a union which cannot defend itself and its membership cannot be much good in defending the country.

"Our goal is that all steel be made by members of the SWOC and then when Hitler's army gets one of these gun shells right in its middle, they will know that it was made by union men. Seven days a week we back Roosevelt against Hitler."

FEWC Presents Demands in International Harvester Dispute

Farm Equipment Workers Committee, CIO, has made known the demands upon International Harvester Co., Chicago, for settlement of current labor difficulties.

Three points are enumerated: 1—Co-operation of company and union to increase production of national defense material, including tanks; 2—Dropping union's demand for the closed shop and substituting a provision for "union security;" 3—Arbitration of the union's demand for wage increases.

Reports Tool and Die Plants Operating at 35% of Capacity

R. J. Thomas, president of the UAW-CIO, last week forwarded to a House committee investigating migrations of labor a survey indicating that equipment in 34 Detroit tool and die plants is now being used at no more than 35 per cent of capacity. He urged immediate steps to increase the rate of operation of this equipment both as a solution of coming unemployment in automobile plants and to speed arms output.

SWOC Threatens Nation-Wide Tieup of American Can Plants

Nation-wide tieup of American Can Co. plants has been threatened by the Steel Workers Organizing Committee, CIO, unless a labor dispute in two plants at Chicago is quickly settled. The union has notified American Can of its intentions, after a breakdown in negotiations for new contract. About 2000 workers left the Chicago plants Sept. 15 subsequent to the company's action in calling police during a sitdown strike..

Elimination of the wage differential between West Coast and Chicago plants, a modified vacation plan and a union shop are asked by the union. Negotiations resumed under Department of Labor sponsorship after the September walkout had proved unavailing.

The union claims it has contracts covering 16 of the company's 27 plants, and has more than 15,000 members in all plants.

Bethlehem To Expand Three Plants; OPM Asks More Alloy Steel Capacity

■ BETHLEHEM Steel Co. and Defense Plant Corp. have entered an agreement for the construction of new pig iron, coke, open-hearth steel ingot and plate capacity to cost approximately $55,777,000.

Pig iron plants will be located at Bethlehem and Steelton, Pa., Sparrows Point, Md., and Lackawanna. The plate mill will be at Sparrows Point.

Plants will have capacity of 1,332,000 tons of pig iron, 1,194,000 tons of coke, and 180,000 tons of steel ingots. Plate mill capacity will be about 720,000 tons annually.

Defense Plant Corp. will own the plants, which will be operated by Bethlehem under a lease arrangement.

OPM last week also recommended an increase of 318,000 tons annually in electric alloy and stainless steel ingot capacity by Republic Steel Corp. at Canton, O., for the manufacture of aircraft forgings and to provide armor plate for tanks.

Recommendation was made by Director-General Knudsen to Defense Plant Corp., and was based on the report by W. A. Hauck, steel consultant.

An increase of 1,000,000 tons in electric alloy ingot capacity is urgently needed, the report said, as well as finishing plants to manufacture hardened steels for aircraft, tank armor, shells and machine tools if the defense production program is to continue at high speed.

The proposal calls for five 50-ton electric furnaces and necessary supplementary equipment. It was estimated the plant can be in operation within five or six months, if the necessary priority ratings are granted.

Jesse Jones, federal loan administrator, has announced the Reconstruction Finance Corp. has authorized a $410,000 loan to Pittsburgh Steel Foundry Corp., Pittsburgh.

Details of Columbia Steel Co.'s Project

Columbia Steel Co., subsidiary of United States Steel Corp., has announced details of its program to increase the capacity of its Pittsburg, Calif., plant, which will place it in a stronger position to meet the demands of national defense.

Program includes the addition of a new semicontinuous rod mill and billet heating furnaces, rod cooling and handling equipment. The rod mill will be housed in a new building east of the plant's open hearth building.

Plant's wire and nail mill will be improved and extended to include additional wire drawing and nail machines, and new facilities for the manufacture of some wire products, the production of which was formerly confined to eastern mills. Warehousing facilities of the wire mill also will be increased.

Some changes also will be made to the primary rolling mills allowing production of longer rod billets.

Steelmaking capacity of the Pittsburg plant is being increased to the extent of 77,000 tons of ingots annually by the installation of a new open hearth furnace and by an increase in the capacity of the four existing open-hearth furnaces. The program will require extension of the plant's open hearth building, the addition of new ladles, and additional ladle crane, and a new charging machine.

■ Navy Department has issued instructions to all shore agencies calling upon them to salvage spark plugs for inclusion in separate lots for scrap sales. The instructions followed receipt of a letter from the OPM calling attention to the substantial quantities of brass, steel and nickel alloy being recovered from spark plugs by various agencies of the government.

"Full Construction Phase of Defense Program Is Yet To Be Contracted"

■ PROGRESSIVELY less steel will be available for civilian uses in the months ahead, Stanley B. Adams, of the OPM Iron and Steel Section, warned members of the American Institute of Steel Construction Inc. in convention at The Greenbrier, White Sulphur Springs, W. Va., Oct. 14-17.

Members of the industry, appraising the tremendous arms appropriations, appeared confident, however, that defense construction would offer a market for a considerable tonnage of fabricated steel for several years.

Speaking at a "priorities clinic," Mr. Adams said: "Prevailing opinion in Washington is that structural steel fabricators are in for some pretty tough sledding in the months ahead." He predicted no new building not justified for defense will be permitted, and that additions or expansions other than those required for defense will not be approved.

Emphasizing that all civilian uses of steel and other critical metals will be further curtailed, Mr. Adams said he doubted that the automobile builders will be able to obtain the materials necessary to produce their sharply reduced quota of new cars this year.

One of the reasons for the current steel shortage, Mr. Adams pointed out, is that when substitutions are made for other scarce and critical materials steel usually is the material substituted, thereby imposing a greater than commensurate load on steel producing capacity.

Col. John F. Coneybear of the OPM Priorities Division explained a new maintenance, repair and operating supplies order, a refinement of earlier maintenance and repair orders, which is designed to allow all manufacturing plants to be maintained in full operating condition. The new plan provides for the granting of an A-10 rating for fuel, lubricants, small perishable tools and other maintenance and repair parts or essential operating supplies. Order does not cover materials for improvements to plant or for expansions or additions.

Bruce R. Puckett described the project rating plan and assured the group that applications for project ratings would not be delayed. Ratings will be granted only to projects (1) necessary for direct defense, or (2) essential to civilian health and welfare.

Mr. Puckett also described the progress being made in the Priorities Division in expediting inquiries and applications and the care that projects obtain their proper rating. Officials are determined, he said, that there shall be "no inflation in the preference rating system."

Representatives of the Priorities Division advised the fabricators that if they were unable to obtain material needed for defense work with a given rating, that the case with a complete statement of facts should be submitted to the division. If warranted, a rating high enough to assure prompt delivery of the material would be granted.

More Defense Building in Sight

Clyde G. Conley, president of the institute and of the Mt. Vernon Bridge Co., Mt. Vernon, O., pointed out that indicated steel production in 1941 represents an increase of 90 per cent over 1939.

"We should not lose sight of the fact that the present is an 'emergency' demand. The present capacity is an 'emergency' capacity. It would be foolish to expect that the industry will again face such a demand once this war is ended. At the peak of the boom in 1929 the industry produced only 63,200,000 tons of steel. And what is true of the industry as a whole is, in a measure, true of the structural steel industry as a branch.

"During 1940 the capacity to produce heavy structural steel shapes was a little more than 5,000,000 tons a year. During that year the mills rolled 3,355,685 tons. Or, in other words, only 60.5 per cent of their capacity was occupied. The capacity of sheared and universal plates was 6,095,450 tons and they produced 4,323,408 tons, operating at 68.8 per cent of capacity. During 1941 the rate of operation has been rapidly stepped up, and some 150,000 tons of capacity to produce heavy shapes have been withdrawn or diverted to other war uses.

"All requisite needs, both civilian and defense, have been met. The fabricators of structural steel have not been nearly taxed to capacity. Most of us have not been able to operate more than one shift. Neither the materials nor the demand was present to warrant any greater volume of operation. There has been, however, no diminution of the urgency. We have been called upon for speed and more speed even on the small volume of business our industry has received. In no case have we failed those expectations."

Mr. Conley was optimistic over the prospects for the fabricators over the next several years, despite the likelihood less steel would be available for civilian uses. Congress, he pointed out, has appropriated $60,000,000,000 for national defense to be spent in 1941 and the two following years. "Obviously we must build additional munitions plants, more bases and stations, more warehouses, if the scheduled rate of defense spending is to be attained. The full construction phase of the program is yet to be contracted."

V. G. Iden, secretary of the institute, said most of the fabricated structural steel has been for direct or indirect defense. "During this year from 70 to 90 per cent of the business has been for defense. Before priority ratings were put into

AMERICAN INSTITUTE OF STEEL CONSTRUCTION
J. LLOYD KIMBROUGH MEDAL
FOR OUTSTANDING CONTRIBUTION TO THE STEEL CONSTRUCTION INDUSTRY
AWARDED OCT 1941 TO ROBERT MOSES
AISC

■ **The J. Lloyd Kimbrough medal, conceived in memory of the first president and one of the founders of the American Institute of Steel Construction, was awarded to Robert Moses, commissioner of parks for New York city, at the institute's nineteenth annual convention at White Sulphur Springs, W. Va., last week. The award, made for the first time this year, is reserved for special distinction and will not necessarily be made periodically. In awarding the medal to Mr. Moses, the institute cited the fact that he had spent more than $500,000,000 on state and city parkways, parks, bridges and beaches and has brought to fruition many of the outstanding structural steel projects in the country. Unable to attend the presentation in person, Mr. Moses accepted the award in a radio address transmitted to the institute's annual banquet**

effect the industry realized the importance of defense work and gave it preference in delivery.

"An industry whose product is probably not more than 25 per cent for private consumption will necessarily find itself compelled to postpone or delay delivery of its private jobs. Despite that tendency we have, in the past, in most cases, given from four to five months' delivery."

Mr. Iden paid tribute to the fabricators for expediting construction of defense projects by delivering steel, in many cases, ahead of contract dates. The record was significant, he added, "because all the rush and the hurry came upon the eve of a winter marked by storms, snows, rain and mud. It was not a propitious season of the year, but by expedients our industry found one way or another of overcoming the unanticipated impediment to the early and successful conclusion of its contracts."

Col. G. F. Jenks, ordnance department, United States Army, explained the application of welding in the construction of ordnance material.

To obtain maximum power within weight limitations, the Army has increasingly turned to welded construction, where feasible, and to the use of low alloy steels in many applications where carbon steels formerly were used.

Colonel Jenks emphasized that interchangeability of parts in the field was essential because the greatest wear on most ordnance materials was not ordinary fatigue but that due to gun fire. Colonel Jenks' lecture was illustrated with slides showing principal ordnance materials, the evolution in the manufacture of which he explained.

"America's Critical Shortage Not in Materials, but in Character, Spirit"

■ MATERIAL shortages in our defense program can be corrected by increased effort and better planning. Deficiencies in spirit—in character—are not so easily remedied. But to be successful in the defense of the free way of life, America's mass mind must be rekindled and an appreciation of the value of our free institutions must be awakened.

This appraisal of "Shortages—Material and Otherwise" was presented to the Joint Regional Foundry Conference, Purdue University, West Lafayette, Ind., Oct. 17, by E. L. Shaner, editor-in-chief, STEEL, and president, Penton Publishing Co.

Must Double Effort

"Today only about 15 per cent of our national resources is devoted to defense. We are told this percentage must be upped to more than 30 per cent by the end of 1942 and that we may have to exceed 50 per cent at the peak of our effort.

"This means that on the average, every industrial concern must be turning out twice as much output in October, 1942, as it is in the present month. Companies now heavily engaged in defense work cannot hope to double their production, but others which until now have not shared in defense orders extensively can multiply their defense effort tenfold or more.

"Within a short time—probably in the next few weeks—a call will go out from Washington for an increased intensity in defense effort.

"American industry can meet this challenge if it is accorded a reasonable chance to do so. But to be successful in the job allotted to it, industry must have better co-operation from government and from other divisions of American society than it has received thus far in the present emergency.

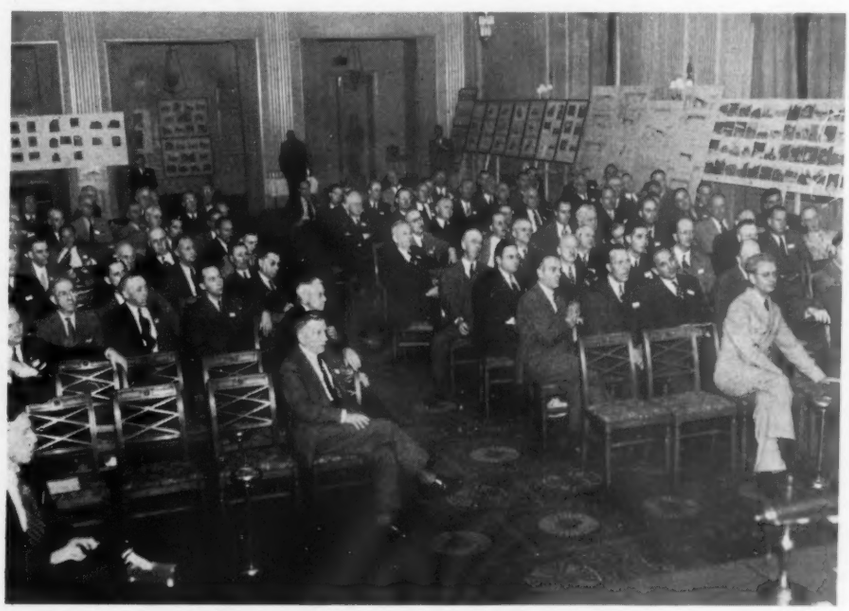
"To date the American public not only has been apathetic to the defense program itself but it also has been unmindful of the extent to which minority pressure blocs have interfered with the nation's effort to prepare for defense and for aid to the allies. This shortage in the American spirit is more important and infinitely more disconcerting than the shortages in materials which have been plaguing industry these recent months. . . .

"An important phase of this crisis is the present wave of strikes in defense industries. . . . These strikes, which are cutting so heavily into the defense program, are being perpetrated under the protective wing of the one-sided Wagner act and with the tacit approval of elements in our government who do not realize that the pendulum of power for labor has swung too far to the left.

"The labor situation has become so bad that there is no question but that at this moment it constitutes the major menace confronting the nation. As long as our government permits the greed of a small group of labor dictators to take precedence over the nation's defense effort, there is no hope of rekindling the American spirit which is so essential to the success of the war.

"The critical shortage in America does not involve material things. We can manage to develop the physical plant, equipment, supplies and materials required to win the war.

"But can we overcome the shortage in the character and in the spirit of ourselves?"



■ **Members of the American Institute of Steel Construction hear Priorities Division and OPM Iron and Steel Section representatives explain the workings of the preference rating system and discuss the availabilty of steel. The priorities clinic was one of the best attended business sessions of the convention**

Building Costs 20.8% Higher Than Year Ago

■ Third quarter industrial building costs were 20.8 per cent higher than a year ago, according to an index compiled by The Austin Co., Cleveland. Company's index stands at 110, up one point over the second quarter and 19 points over third quarter, 1940.

Advance reflects the cumulative effects of higher unit costs for construction labor and a continuing upward trend in building material prices.

Triple Mill Supply Groups Hear Allocation System To Be Necessary

■ TO KEEP as many small nondefense manufacturers in existence as possible and thus prevent a collapse in our economy, some sort of allocation system must be applied to scarce materials, particularly metals, according to Albert J. Browning, assistant to Donald M. Nelson, director of priorities and executive director of SPAB.

Mr. Browning, who was recently assigned by Mr. Nelson to the task of devising such a system, made this statement before a joint session of the American Hardware Manufacturers Association, the National Wholesale Hardware Association and the National Association of Sheet Metal Distributors, all holding semiannual conventions in Atlantic City, N. J., last week.

No definite plan yet has been evolved but explorations indicate it will follow somewhat the lines of the allocations system of 1918. At that time the War Industries Board worked in co-operation with industry committees, deciding the volume of a particular material to go into a particular industry and, subsequently, apportioning that quantity among various plants in that industry.

"Must Chart Same Path"

"The path charted then seems to be the path we must chart now . . . That is the prevailing thinking in Washington," said Mr. Browning.

"Take copper, for example. We will produce 1,800,000 tons in 1942. Defense will require 1,000,000 tons. That means nondefense can have only 800,000 tons instead of 1,500,000 tons which would be the case if all demands could be satisfied. We are hoping that new standards can be set up, that designs can be changed, so as to make this amount of copper go farther and hence suffice for more production. The point is we want to keep nondefense plants going as far as is possible. Some of them are bound to be closed, but we do want to minimize the degree of this shock."

J. R. Stuart, chief, Warehouse Section, Iron and Steel Branch, OPM, told sheet metal distributors that first quarter quotas would be as liberal as possible but warned that the warehouse interests cannot expect to rebuild their stocks for a number of months.

Curtailment in production of automobiles, household refrigerators and other products will not bring any easement in the near future because the slack will be taken up fully by substantially increasing defense consumption.

Questions indicated certain misunderstandings among distributors. Orders with a better rating than A-9 definitely cannot be included when reporting for a blanket A-9 quota, said Mr. Stuart. One distributor who normally buys a certain product in the fourth quarter but who last year anticipated by taking in the tonnage in September was told he is out of luck this year for the reason that what was not bought in the last quarter of 1940 cannot be used in applying for fourth quarter of 1941 tonnage.

Distributors who furnished much steel for defense plant construction in fourth quarter of 1940 are able to get more steel now for that reason on the quota basis. On the other hand, distributors who furnished little steel for defense construction will get less steel on the quota basis even though they since have furnished large tonnages for this purpose.

Mr. Stuart made it clear that OPM understands that these inequalities exist. They cannot be eliminated as it is impossible to consider each of the many thousands of cases separately. The quota system for distributors, he said, was set up for the good of the largest possible number, and is working out that way.

Many distributors fail to read carefully the priority orders and forms, said Mr. Stuart. For example, many distributors are not in a position to report their iron and steel inventories as of Sept. 30 despite the fact that in the letter which was sent out with PD-83-a it was definitely stated that such inventory information would be required.

Reason exists for believing that industry is developing a more favorable position in the eyes of both Washington and the general public, Ernest V. Moncrieff, president, Swan-Finch Oil Corp., New York, told a joint session of the hardware manufacturers and the hardware wholesalers.

Reasons are: A growing public indignation over the manner in which organized labor is exploiting its selfish interests; an increasing concern with the favored position of the farmer and the resulting increase in the cost of living; and a growing understanding that private industry is hampered by current national policies in contributing with maximum effectiveness to the defense production program.

Industry, however, needs much more positive assurances of fair treatment before it can feel safe, particularly from the standpoint of meeting conditions that will develop after the war. While current sentiment seems to be a little more friendly to business, nothing tangible so far has resulted from it. Current laws and policies will have to be changed greatly, said Mr. Moncrieff, if we are to have a stable America in the future.

Mr. Moncrieff advised employers to follow a policy of keeping all the cards on the table, particularly in dealing with employes.

Even college professors and school teachers are beginning to realize that something is wrong with this country, declared Dr. G. W. Dyer, Department of Economics, Vanderbilt University, Nashville, Tenn., in addressing the two hardware associations in joint session with the sheet metal distributors. They are beginning to sense that the Wagner act deprives employers of constitutional rights. They are beginning to believe that the Supreme Court has ceased functioning as the guardian of the public's rights under the constitution and now is working as an arm of the administrative branch of government.

College professors and school teachers with whom he has talked of late, said Professor Dyer, are beginning to ask what sort of democracy we are fighting for—the kind that produced Hitler in Germany, Stalin in Russia, the kind that made France destroy herself? Dr. Dyer expressed hopes that the better understanding of our country's needs which now seems to be in process of generation will bring, in time, a return to the democratic form of government which brought prosperity to the United States in the past.

Officers Elected

National Association of Sheet Metal Distributors re-elected: President, A. J. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind.; vice presidents, Eugene Foley, Bayonne Steel Products Co., Newark, N. J., and George O. M. Johnston, McClure-Johnston Co., Pittsburgh. George A. Fernley continues as advisory secretary-treasurer, and Thomas A. Fernley Jr. as secretary-treasurer. Terms of H. E. Usinger, Berger Bros. Co., Philadelphia, and Bruce Haines, E. E. Souther Iron Co., St. Louis, on the executive committee, have been extended through 1944.

National Wholesale Hardware Association re-elected: President, Glenn E. Jennings, Wright & Wilhelmy Co., Omaha, Nebr.; vice presidents, W. W. French, Moore-Handley Hardware Co., Birmingham, Ala., F. F. Thomson, The

Thomson-Diggs Co., Sacramento, Calif., and A. J. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind. George A. Fernley continues as secretary-treasurer, and Thomas A. Fernley Jr. as assistant secretary-treasurer. New members of the executive committee are R. R. Witt, Builders Supply Co., San Antonio, Tex., E. F. Pritzlaff, John Pritzlaff Hardware Co., Milwaukee, and I. S. Dillingham, Bigelow & Dowse Co., Boston.

American Hardware Manufacturers Association re-elected: President, Richard Harte, Ames Baldwin Wyoming Co., Parkersburg, W. Va.; vice presidents, P. E. Barth, Sargent & Co., New Haven, Conn., and S. T. Olin, Western Cartridge Co., East Alton, Ill. New vice president, succeeding N. J. Clarke, Republic Steel Corp., Cleveland, is J. S. Tomajan, Washburn Co., Worcester, Mass. New members of the executive committee for three years are W. H. Baker, Universal-Cyclops Steel Co., Bridgeville, Pa., L. B. Jackson, Wickwire Brothers Inc., Cortland, N. Y., and H. F. Seymour, Columbian Vise & Mfg. Co., Cleveland. Charles F. Rockwell continues as secretary-treasurer.

Metal Supplies To Be Ample, Says Jeffries

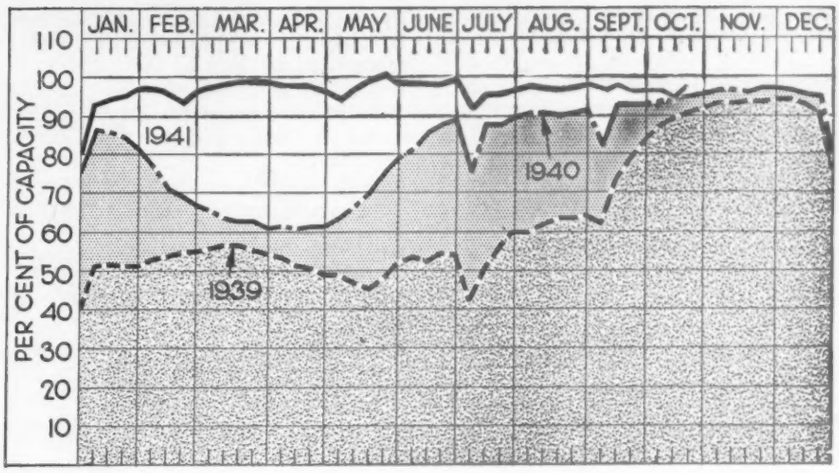
■ "Ample metal for the greatest defense production of all time" will be available in America, Dr. Zay Jeffries, metallurgist, General Electric Co., Schenectady, N. Y., declared last week at the autumn meeting of the National Academy of Sciences, in Madison, Wis.

Dr. Jeffries, chairman of the academy's Committee on Metal Conservation, organized to advise the Office of Production Management on problems pertaining to mineral resources, further stated that "plans are under way all along the line to expand production of the primary metals. Magnitudes range from millions of tons of pig iron and steel, down.

"The people having the least confidence in our ability to produce," he said, "are those farthest from the production lines. The men in the storm-center of production—executives, engineers, scientists, foremen and skilled workmen—have unbounded faith that our defense production will greatly surpass anything the world has ever seen.

"Assuming that the latter group is the better qualified to pass judgment, we are, even now, in great need of unity of purpose . . . lest this vast production come too late.

"In addition to a sufficiency of metals for the defense effort there will be ample metal to keep up all the essential services, including food, heat, light, transportation, communication, water and gas . . ."



PRODUCTION . . . . Up

■ PRODUCTION of open-hearth, bessemer and electric furnace ingots last week advanced 2 points to 96½ per cent due to fewer labor interruptions at Chicago. Three districts advanced, three declined and six were unchanged. A year ago the rate was 95 per cent; two years ago it was 91 per cent.

St. Louis — Unchanged at 83 per cent. One producer which had reduced output because of scrap shortage may add one or two open hearths soon.

Detroit—Dropped 23 points to 68 per cent, due to strike at Great Lakes Steel Corp. plant, 15 open hearths being taken off and two blast furnaces banked.

Cincinnati — Slightly better scrap supply brought additional furnaces into operation, the rate rising 6 points to 88 per cent.

Birmingham, Ala. — Held at 95 per cent, with 23 open hearths active.

Central eastern seaboard — Despite threatened curtailment by lack of scrap production held unchanged at 93 per cent.

Cleveland — Slight increase by one producer caused a rise of 1 point to 99 per cent.

Chicago — Rose 10½ points from the revised rate of 90½ per cent the previous week, to 101 per cent. Labor interruption prevented scheduled rate of 102 per cent last week.

New England — With one open hearth idle for repair production continued at 90 per cent.

Pittsburgh—Receded 1 point to 98 per cent.

Buffalo—Maintained 93 per cent in spite of declining scrap supply.

Wheeling—Declined 3 points to 93 per cent because of repairs.

Youngstown, O.—Consistent production at 98 per cent is maintained with 76 open hearths and three bessemers active. Shenango Furnace Co., Sharpsville, Pa., has banked two blast furnaces because of a strike. Construction of Republic's new stack will start within ten days.

District Steel Rates

Percentage of Ingot Capacity Engaged In Leading Districts

	Week ended Oct. 18	Change	Same week 1940	Same week 1939
Pittsburgh	98	— 1	90	89
Chicago	101	+10.5	99	89
Eastern Pa. ...	93	None	93	72
Youngstown ..	98	None	90	94
Wheeling	93	— 3	98	93
Cleveland	99	+ 1	85.5	90
Buffalo	93	None	90.5	86
Birmingham ..	95	None	97	90
New England..	90	None	85	100
Cincinnati	88	+ 6	90	88
St. Louis	83	None	82.5	77
Detroit	68	—23	96	96
Average	96.5	+ 2	95	91

Canada's Steel, Iron Output at New High

■ Canadian production of steel ingots and castings in August was 202,746 gross tons; pig iron, 105,795 tons; and ferroalloy, 16,251 tons.

All-time records were made in cumulative totals for eight months. Steel ingots and castings in that period totaled 1,548,497 tons, or 19.1 per cent more than 1,300,033 tons in the corresponding period in 1940. Pig iron output increased 13.6 per cent.

The Dominion Bureau of Statistics has revised the ferroalloy total, its previous report for seven months having been 150,479 tons. Summary:

	Steel Ingots, Castings	Pig Iron	Ferro-Alloys
August, 1941	202,746	105,795	16,251
July, 1941...	197,316	102,005	17,599
August, 1940	172,210	88,885	9,697
8 Mos., 1941.	1,548,497	833,351	121,730
8 Mos., 1940.	1,300,033	734,436	77,198
8 Mos., 1939.	813,309	422,028	40,692

MEETINGS

Foundry Equipment—Present and Future

■ FOUNDRY Equipment Manufacturers Association Inc. will hold its annual meeting at The Greenbrier, White Sulphur Springs, W. Va., Oct. 24-25. A round table discussion will have as its theme "The Foundry Equipment Industry—Its Present and Future Position," and will include such subjects as labor conditions, salaries, bonus plans, and legislation.

F. G. Steinebach, chief, foundry equipment and supplies unit, tools and equipment section, Office of Production Management, will be present to answer questions relating to preference rating order No. P-31.

Dr. E. E. Pratt, regional coordinator, division of priorities, Office of Production Management, will deal with such subjects as priorities, future developments and guiding principles.

1942 Foundry Show To Feature Exhibit of War Equipment

Plans for "the most extensive and spectacular Foundry and Allied Industries Show" are being arranged for the Cleveland Public Auditorium and Exhibition Hall, April 18-24, 1942, by the American Foundrymen's Association, which will hold its forty-sixth annual convention at that time.

Approximately 50,000 square feet of space will be assigned to an exhibit of war equipment and materials and educational displays of army ordnance. Displays of all types of castings used in the national defense program are scheduled.

Galvanizers Committee Will Consider Current Problems

Latest information concerning zinc supplies, substitute coatings, specifications and conservation of materials will be made available at the fall meeting of the Galvanizers Committee, William Penn hotel, Pittsburgh, Oct. 31. The meeting will be one day only and will be open only to members of the committee and their representatives.

American Management Group To Meet in New York

Office administration problems arising out of increased defense production will be discussed at the Office Management meeting, American Management Association, Hotel Pennsylvania, New York, Oct. 22-23. Twelve papers are scheduled for six sessions.

Baltimore Purchasing Agents Sponsor Sixth Exhibit

Sixth annual Manufacturers' Products Exhibit, sponsored by the Purchasing Association of Baltimore, will be held at the Lord Baltimore hotel, Baltimore, Oct. 21-23. Various booths will display the latest in mill, factory and office equipment.

Convention Calendar

Oct. 19-24—American Welding Society. Annual meeting at Bellevue-Stratford hotel, Philadelphia. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

Oct. 20-22—American Institute of Mining and Metallurgical Engineers. Annual fall meeting of the Institute of Metals division, iron and steel division at Ritz-Carlton hotel. F. T. Sisco, 29 West thirty-ninth street, New York, is secretary.

Oct. 20-22—American Gas Association. Annual meeting at Auditorium, Atlantic City, N. J. K. R. Boyes, 420 Lexington avenue, New York, is secretary.

Oct. 20-24—Wire Association. Annual meeting at Philadelphian hotel, Philadelphia. R. E. Brown, Stamford Trust building, Stamford, Conn., is executive secretary.

Oct. 24-25—Foundry Equipment Manufacturers Association. Annual meeting at the Greenbrier, White Sulphur Springs, W. Va. Arthur J. Tuscany, 632 Penton building, Cleveland, is executive secretary.

Oct. 31—Galvanizers Committee. Fall meeting at William Penn hotel, Pittsburgh, E. V. Gent, 60 East forty-second street, New York, is secretary.

Nov. 5-6—Society of Automotive Engineers, Inc. West Coast transportation and maintenance meeting, Fairmont hotel, San Francisco. John A. C. Warner, 29 West thirty-ninth street, New York, is secretary.

Nov. 13-14—Society of Automotive Engineers, Inc. National transportation and maintenance meeting, Hotel Statler, Cleveland. John A. C. Warner, 29 West thirty-ninth street, New York, is secretary.

DIED:

■ **Harold Fowler McCormick,** 69, chairman, International Harvester Co., Chicago, at his home in Beverly Hills, Calif., Oct. 16.

Son of Cyrus H. McCormick, inventor of the reaper, he spent his entire busines life at Harvester and succeeded his late brother, Cyrus, as its head. Mr. McCormick became vice president in 1902 at the age of 30, and president in 1918. Today his son, Fowler, is president. He became chairman in 1935 after having been chairman of the executive committee since 1932.

♦

Lee Roy Kells, 51, sales engineer, Wellman Engineering Co., Cleveland, at his home in Cleveland Heights, O., Oct. 4. Before joining Wellman in October, 1940, Mr. Kells was associated with Salem Engineering Co. as chief engineer.

♦

Frederick J. Leach, 68, research engineer, American Steel & Wire Co., Cleveland, in that city, Oct. 14. He had been associated with the company 13 years.

♦

Henry Clay Varnes, 84, retired superintendent of the Bourne-Fuller division of Republic Steel Corp., Cleveland, in that city, recently. He had been identified with the steel industry 57 years prior to his retirement ten years ago.

♦ ♦ ♦

A. C. Montgomery, 54, assistant chief engineer, American Steel & Wire Co., Cleveland, Oct. 10, in that city. He had been associated with the company since 1914.

♦

Thomas E. Henry, 73, founder and chairman of the board, Henry Furnace & Foundry Co., Cleveland, in that city, Oct. 3.

♦

Paul F. Reichman, president, American Swiss File & Tool Co., Elizabeth, N. J., Oct. 3, in Montclair, N. J.

♦

Albert Edward Tower, 78, former owner of iron mines in Dutchess county, N. Y., and the old Poughkeepsie Iron Co. furnaces, Poughkeepsie, N. Y., Oct. 8 in Newport, R. I.

♦

Cassius F. Biggert, 70, vice president in charge of raw materials, International Harvester Co., Chicago, until his retirement in 1937, in Evanston, Ill., Oct. 13. He had been in the employ of the company 47 years.

♦

Dr. Frank A. Fahrenwald, 53, president, Fahralloy Co., Harvey, Ill., Oct. 13.

♦

Louis A. Meyran, 82, chairman of the board, Parkersburg Iron & Steel Co., Pittsburgh, Oct. 9, in that city.

Ohio Crankshaft Co. Observes 21st Birthday

■ Ohio Crankshaft Co., Cleveland, this month is observing the twenty-first anniversary of its founding. Organized by President William C. Dunn and Vice President F. S. Denneen in a 40 x 60-foot garage, the company now operates four plants covering 450,000 square feet of space. Eighty per cent of company's capacity is for defense. In a new 219,000-square foot plant, a subsidiary company, Ohio Crankshaft Inc., is producing 206-pound crankshafts for 14-cylinder Wright Cyclone radial aircraft engines.

■ Malleable iron castings production in August was 68,570 net tons, against 67,010 tons in July and 48,926 tons in August, 1940, according to the Bureau of the Census. Output in eight months totaled 551,518 tons in 1940 and 335,954 tons in the corresponding period in 1941.

Maintenance, Repair Order Amended To Cover More Manufacturing Plants

■ PREFERENCE Rating Order P-22 has been amended to extend a priority rating of A-10 to cover maintenance and repair materials for thousands of industrial plants.

Those granted the rating, which is a defense rating, include, among others, plants engaged in manufacturing, processing or fabricating; warehousing, maintenance of warehouses for storage or distribution of any material; wholesaling, acting as distributor of products sold to manufacturers, wholesalers, retailers or other persons not consumers; carriers, including urban, suburban, interurban common contract carriers of passengers or freight by electric railway, electric coach, motor truck or bus, including terminals; shipping, including commercial carriers, freight, passengers by ocean, lake, river or canal and terminals; printers and publishers, radio telephone and telegraph, including wire services.

Application Unnecessary

Any plant qualified to use the rating is permitted to do so without application by complying with certain instructions in the order. The rating cannot be used to obtain anything except maintenance repair and operating supplies as defined in the order; purchase orders for repair, maintenance and operating supplies must be made up separately from all other orders where the rating is used.

Rating cannot be used if material is available without rating; producers may use rating only to obtain materials in quantities not exceeding certain 1940 levels as defined in the order, except larger quantities will be permitted in proportion to any increase in operations over the last year's levels.

Utilities and mines covered by separate repair orders are not covered by the present order. This sweeping order to facilitate maintenance and repair operations of many civilian plants applies to all other establishments previously covered by Order P-22. The order is effective immediately and is set to expire April 1, 1942.

49 More Tankers Ordered by Maritime Commission

The Maritime Commission has signed contracts for 49 more tankers, which will give United States the largest tanker fleet in the world. The Alabama Drydock & Shipbuilding Co., Mobile, will build 36 of these, and the remaining 13 will be constructed by Bethlehem Steel Co. at Sparrows Point, Md. Each will be of 10,750 gross tons.

As of Oct. 1, American ship yards had under construction or contract 1071 vessels aggregating 6,202,090 gross tons. In September alone, the Maritime Commission placed orders for 82 cargo ships, and in that month 14 ships were launched from yards in this country.

Commission also has placed 16 ore vessels, ten with the Great Lakes Engineering Works, River Rouge, Mich., and six with the American Shipbuilding Co., Cleveland.

FINANCIAL

Sharon Steel's Net $412,899, Federal Taxes $1,399,000

■ SHARON Steel Corp., Sharon, Pa., reports net income in the quarter ended Sept. 30 after all charges including $1,399,000 provision for federal income and excess profits taxes, was $412,899. This was equal, after preferred dividend requirements, to 86 cents per share on common, and compared with net profit of $365,975 or 74 cents per common share in the period last year.

In the June quarter, 1941, net earnings totaled $285,988 or 54 cents per common share after deduction of $130,000 for federal income and excess profits taxes applicable to the March period.

Aggregate profit in the first nine months was $1,226,140, and was equal to $2.55 per share on common after preferred dividend requirements. In the corresponding period in 1940 net profit was $754,878 or $1.35 per common share.

Continental Steel's Third Quarter Profit $294,592

Continental Steel Corp., Kokomo, Ind., reports net profit earned in the quarter ended Sept. 30, after provision for all known contingencies, was $294,592. Equal to $1.31 per share on outstanding common stock after preferred dividend requirements, this compared with a net income of $139,312 or 53 cents per common share in the corresponding period last year. Net earnings in the second quarter, 1941, totaled $324,435 or $1.45 per common share.

Aggregate profit in the first nine months this year was $932,149, equal to $4.16 per share on common. In the period in 1940, net income totaled $492,107 or $1.96 per share on common.

Net sales in the quarter were $6,599,205, against $5,088,221 in the period last year. For the first nine months combined sales were $19,463,137, compared with $13,134,409 in the corresponding three quarters in 1940.

Regular quarterly dividend of $1.75 per share on preferred and one of 25 cents per share on common were paid Oct. 1 to record of Sept. 15.

$352,414 Net Reported by Keystone Steel & Wire Co.

Net income earned by Keystone Steel & Wire Co., Peoria, Ill., in the quarter ended Sept. 30, the first period of the company's fiscal year, totaled $352,414 after all charges including federal income taxes and provision of $127,420 for excess profits taxes, it was reported last week. This was equal to 47 cents per share on the company's outstanding capital stock, and compared with net income of $280,409 or 37 cents per share in the corresponding period in 1940.

In the fiscal year, ended June 30, net income was $1,618,376 after all charges, and was equal to $2.13 per share. This compared with $1,418,221 or $1.87 per share in the preceding year.

Woodward Iron Co. Earned $1,032,623 in Nine Months

Woodward Iron Co., Woodward, Ala., earned $1,032,623 net profit, after federal income and excess profits taxes, in the nine months ended Sept. 30, the company reported last week. This was equal to $3.09 per share on capital stock outstanding, and compared with $1,383,611 or $4.52 per share in the corresponding period in 1940.

Acme Steel Co.'s September Quarter Income $761,154

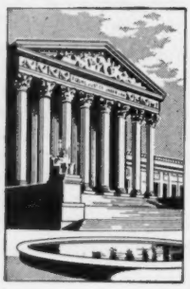
Acme Steel Co., Chicago, steel finisher, reports net profit in the period ended Sept. 30 was $761,154 after depreciation and a $1,294,742 provision for federal normal and excess profits taxes. This was equal to $2.32 per share on the capital stock outstanding.

Net earnings in the quarter in 1940 totaled $602,688 or $1.84 per share. Revised net income in the June quarter, 1941, was $900,302 or $2.74 a share.

■ Production and shipments of molybdenum in August were 3,780,300 pounds and 4,264,700 pounds, respectively, compared with 3,354,200 pounds and 2,961,700 pounds in July, according to the Bureau of Mines.

Windows of *WASHINGTON*

Crackdown on violators of priorities regulations launched. Chicago firm penalized for diverting aluminum to nonessential uses . . . Auto production for January limited to not more than 51 per cent of output in comparable 1941 month . . . Preference ratings extended to tank partsmakers, lift truck builders, Latin American copper producers . . . Warehouse order amended



By L. M. LAMM
Washington Editor, STEEL

WASHINGTON

■ PUNITIVE action taken by Priorities Director Nelson against the Central Pattern & Foundry Co., Chicago, for alleged violations of priorities regulations is "only the beginning" of an enforcement campaign, Mr. Nelson declared last week after issuing an order suspending the company's aluminum operations until March 31.

Chief charge against the company was that in July it shipped 41,449 pounds of aluminum products for nonessential uses in violations of the orders. Shipments were made to manufacturers of juke box machines, coin and coin operated machines, railroad coach seat manufacturers, camera makers and vacuum cleaner builders.

The order declared the company had misrepresented its scheduled shipments of aluminum for July, had failed to obtain the required statements as to inventories and orders from its customers, and had without authorization accepted deliveries of aluminum scrap.

For the duration of the suspension the company may not: (a) Accept any deliveries of aluminum from any source; (b) accept any purchase orders for delivery of aluminum.

It is provided, however, that the company may make delivery of aluminum and aluminum products for the fulfillment of defense orders on its books Oct. 1.

Commenting on the order, Mr. Nelson said: "I can assure you we are starting right in and we will proceed to go through the works." He added that an intensive investigation is underway among 1800 aluminum consuming companies.

Similar action will be taken in other industries, he declared.

January Auto Output Cut At Least 51% Below Last Year

Passenger automobile production in January, 1942, will be curtailed at least 51 per cent below last January's output in a further effort to conserve steel and other scarce materials for national defense.

Manufacturers will be limited to a maximum output of 204,848 passenger cars in January, compared with 418,350 in the same month a year ago. Leon Henderson, OPM Director of Civilian Supply, warned, however, that there is no guarantee that sufficient materials will be available to fulfill this maximum.

The January curtailment, with the 26.5 per cent cut ordered for August, September, October and November, and the 48.4 per cent reduction required for December, will result in an over-all curtailment of at least 36.3 per cent for the first six months of the model year that began Aug. 1.

Production for the six-month period can be 1,228,065 cars, depending upon availability of scarce materials, compared with 1,928,517 during the period last year.

OPM Extends Time Limit on Pig Iron Producers' Reports

OPM reported last week that the eight-day interval provided pig iron producers for filing shipment schedules and for approval of such schedules under preference rating order M-17 having proved insufficient, an amendment has been granted calling for filing of such reports on or before the twelfth of the month and provides that their return to OPM shall be made on or before the twenty-fifth of the same month.

Light Tanks and Component Parts Given Priority Status

Priorities Director Nelson has issued two preference rating orders to assist a number of prime manufacturers of component parts, armament and accessories and medium and light-weight tanks.

Preference order P-26-e is a supplement to several previous orders listed serially P-26 A, B, C and D, and assigns the same rating covered by these orders, A-1-d, to delivery of materials for production of parts,

Highspots of the Week's Washington News

Maintenance and repair order amended to aid thousands of additional manufacturing plants.

OPA to permit scrap imports at prices higher than ceiling.

Priorities Division starts crackdown on violators of regulations.

January auto production curtailed at least 51 per cent below that in January, 1941; motor truck order extended to Dec. 31.

Pig iron report filing dates extended.

Warehouse order amended to enable distributors to make satisfactory reports.

Lift truck manufacturers granted A-1-g rating.

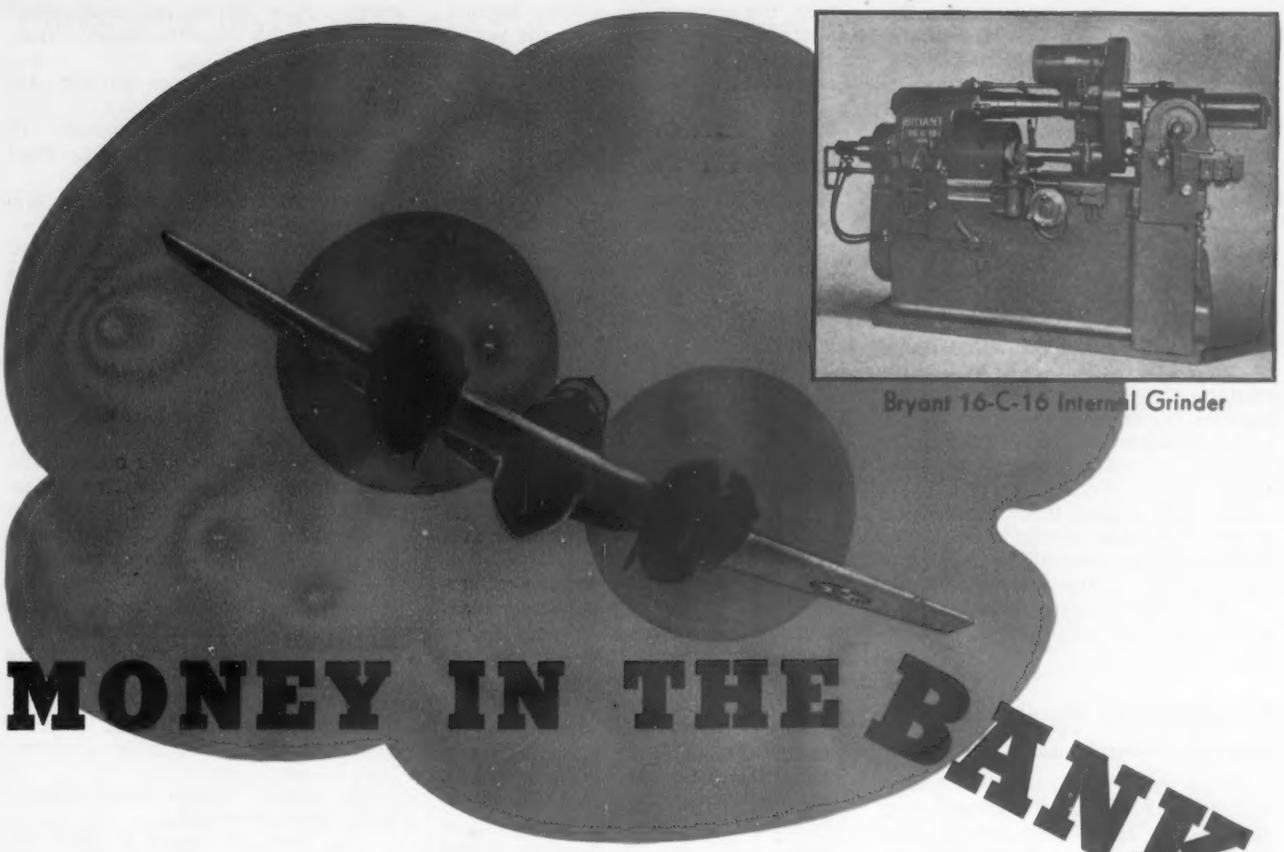
Tank parts and accessories manufacturers granted priority assistance.

Producers of zinc, zinc oxide, zinc dust from secondary materials under toll agreements exempted from setting aside these materials for pool uses.

Aluminum scrap and secondary ingot ceiling prices to be reduced from 1 to 3 cents a pound in forthcoming amendment to Price Schedule No. 2.

Latin American copper mines granted priority aid.

Small tungsten consumers (100 pounds or less a month) relieved of filing monthly reports with OPM.

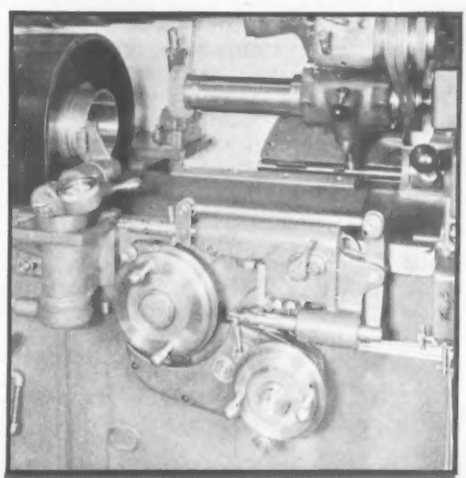


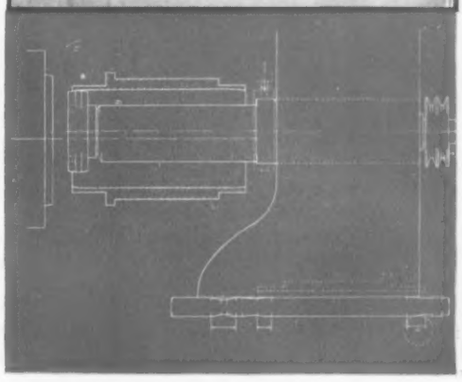
Bryant 16-C-16 Internal Grinder

MONEY IN THE BANK

WHEN PARTS ARE GROUND ON BRYANT GRINDERS

You'll be money ahead if Bryant Hydraulic Internal Grinders are used for grinding all the holes and faces on your parts. These time-saving, cost-saving grinders are "just what the doctor ordered" for both commercial and defense needs. Pictured here is a Bryant 16-C-16 used for grinding the bore of aircraft engine cylinders. The line drawing shows how the control bar guides the wheel in the cylinder so that straight and curved portions may be ground in one handling — with absolute accuracy — fine finish — and at low cost per piece.





Whether you're watching every minute on defense work or watching every penny on peacetime products, it will pay to investigate the Bryant line of Internal Grinders. Put in a Bryant and put money in the bank.

BRYANT CHUCKING GRINDER CO.
SPRINGFIELD, VERMONT, U.S.A.

accessories and equipment for medium tanks, their accessories and spare parts, 37 and 75-millimeter guns and mounts for installation in medium tanks, gasoline and diesel engines, engine accessories for such tanks.

This order was issued to 26 prime contractors who did not receive benefit from preceding blanket rating orders.

The second order, preference rating order P-25-e, extends the priority rating of A-1-f to light tank manufacturers. It covers the same items as in P-26-e with the exception of armament which in the case of these smaller tanks consists of 30 caliber and 37-millimeter guns. This order benefits 12 new contractors on such work.

The new orders limit application of the preference rating to deliveries of materials which will be physically incorporated in the completed tank, as differentiated from former orders which did not include such restriction.

Amendment to Warehouse Priority Order Issued

Amendment to preference rating order M-21-b, which covers steel warehouses and is intended to assist such warehouses as have been unable so far to make satisfactory reports was issued last week by Priorities Director Nelson.

The original order prohibited deliveries after Oct. 5 to warehouses which had not been assigned quotas on the basis of their delivery reports during the first quarter of 1941. Because many such reports have been returned for correction, the warehouses submitting them did not receive quotas, and the present amendment extends to Oct. 31 the date after which such warehouses may not accept deliveries.

The amendment to M-21-b provides that no shipments are entitled to the A-9 preference rating established by the supplementary order unless a quota and rating certificate have actually been issued.

Lift Truck Manufacturers Get A-1-g Preference Rating

Preference rating of A-1-g was extended last week by the director of priorities to manufacturers of power-driven industrial lift trucks to enable them to cover deliveries of the following materials: Iron or steel castings and steel forgings; bars, sheets, plates, shapes and sections, ferrous and nonferrous and nonmetallic; motors and other electrical accessories including batteries; finished or semifinished parts and accessories including wheels and tires; gasoline engines and accessories.

The order stipulates, however, that the rating cannot be applied to deliveries of any item for which a substitute of other more available material may be used.

Motor Truck Order Extended to Dec. 31

A one-month extension of the program to facilitate production of heavy motor trucks, medium trucks and truck trailers was announced last week by Donald M. Nelson, director of priorities. The extension does not change the basic provisions of the program.

Although revisions of the program are under consideration, it is being extended to Dec. 31 in its present form in order to permit manufacturers to place December orders for steel immediately. Manufacturers now are cut out of all December mill schedules.

The extension also applies to production of certain passenger carriers and necessary replacement parts. It means that during the period Sept. 1 to Dec. 31, producers may manufacture two-thirds the number of medium motor trucks, truck trailers and passenger carriers produced during the first half of the year, except that all trucks ordered for specific defense purposes, as defined in the order issued Sept. 14, may be produced without limit.

No restrictions are placed on production of heavy motor trucks which are carrying most of the national defense truck transportation load.

The extension also means that manufacturers of replacement parts may produce during the Sept. 1 to Dec. 31 period 80 per cent of the number of parts sold for replacement purposes during the first half year.

A one-month extension also is provided for Limited Preference Rating Order P-54, which assigns an A-3 rating to materials going into heavy motor trucks (3 tons or more), medium motor trucks (1½ tons or more), truck trailers (5 tons or more), passenger carriers (motor or electric coaches with not less than 15 seats) and replacement parts as specifically listed in the Sept. 14 order. The preference rating may be applied to purchase orders placed before Dec. 1 and calling for deliveries prior to Dec. 31.

The rating permits producers and their suppliers to obtain necessary materials and parts up to the maximum limitation as fixed in Limitation Order L-1-a.

Contract Distribution, Priorities Divisions Open New Field Offices

Field offices of the OPM Contract Distribution Division have been opened in five additional cities. New offices and addresses:

Albany, N. Y., 75 State street, State Bank building.

Portland, Me., Room 501-502, 443 Congress street.

Rochester, N. Y., Chamber of Commerce building, 55 St. Paul street.

Spokane, Wash., 629-630 Old National Bank building.

Springfield, Mass., 95 State street.

This brings the total number of Contract Distribution field offices to 48. Additional offices in other industrial centers will be established as rapidly as possible.

Seven new field offices have been opened by Priorities Division, bringing the total to 34.

Addresses of the new offices, and the names of the District Managers in charge, follow:

Memphis, Tenn., Sterrick building, J. S. Bronson, district manager.

Louisville, Ky., Todd building, Fourth and Market streets, James T. Howington, district manager.

Nashville, Tenn., 1015 Stohlman building, George S. Gillen, district manager.

Helena, Mont., Federal Reserve Bank building, Oscar A. Baarson, district manager.

Knoxville, Tenn., Dyer Butterfield, district manager.

New Orleans, John A. Bechtold, district manager.

Oklahoma City, Okla., Federal Reserve Bank building, C. F. Aurand, district manager.

OPA To Permit Scrap Imports At Above-Ceiling Prices

Authority to import iron and steel scrap from any foreign source at prices exceeding the established maximums will be granted to steel plants and foundries under certain conditions, Price Administrator Henderson announced last week.

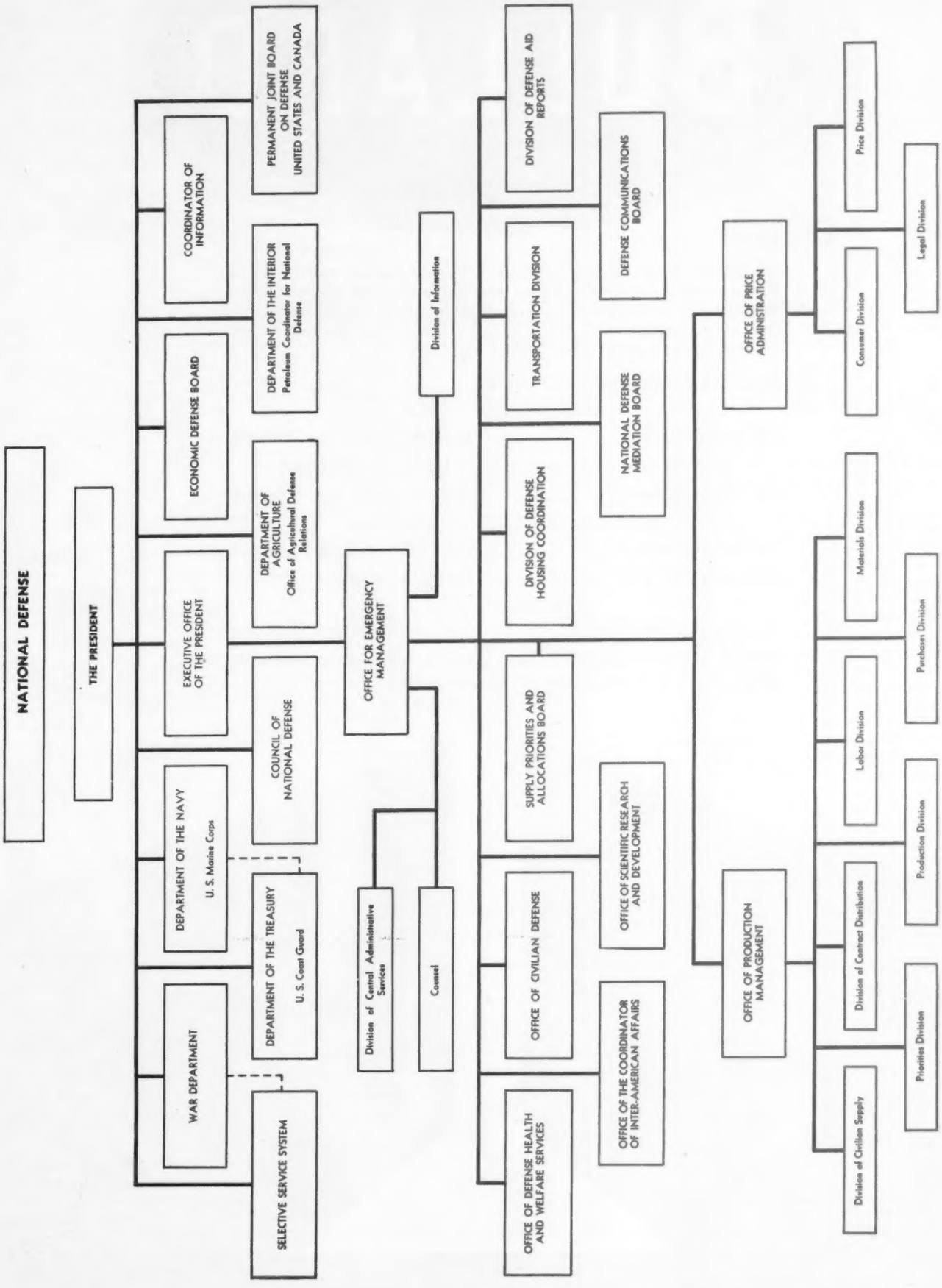
At the same time, OPA issued an amendment to the scrap schedule setting up Cincinnati as a basing point for scrap of railroad origin.

In the case of higher-than-ceiling imports, Mr. Henderson stated, buyers first must apply to OPA for permission, furnishing complete details of the proposed transaction. If authority is given and the scrap brought in, buyer must supply OPA with copies of the bills of lading.

Inquiries from steel plants indicate that scattered supplies of scrap are available for purchase in Cuba, Mexico and Central and South America. OPA considers it important that United States mills and foundries busy on defense contracts be placed in a position to buy and import this important raw material.

The addition of Cincinnati as a basing point for railroad scrap places railroads in that area on a parity with sellers of industrial scrap.

Official Chart Includes All New National Defense Agencies


NATIONAL DEFENSE
THE PRESIDENT
EXECUTIVE OFFICE OF THE PRESIDENT
COORDINATOR OF INFORMATION
ECONOMIC DEFENSE BOARD
PERMANENT JOINT BOARD ON DEFENSE UNITED STATES AND CANADA
DEPARTMENT OF THE INTERIOR Petroleum Coordinator for National Defense
DEPARTMENT OF AGRICULTURE Office of Agricultural Defense Relations
COUNCIL OF NATIONAL DEFENSE
OFFICE FOR EMERGENCY MANAGEMENT
Division of Information
DEPARTMENT OF THE NAVY U. S. Marine Corps
DEPARTMENT OF THE TREASURY U. S. Coast Guard
WAR DEPARTMENT
SELECTIVE SERVICE SYSTEM
Division of Central Administrative Services
Counsel
OFFICE OF DEFENSE HEALTH AND WELFARE SERVICES
OFFICE OF CIVILIAN DEFENSE
OFFICE OF THE COORDINATOR OF INTER-AMERICAN AFFAIRS
SUPPLY PRIORITIES AND ALLOCATIONS BOARD
OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT
DIVISION OF DEFENSE HOUSING COORDINATION
DIVISION OF DEFENSE AID REPORTS
TRANSPORTATION DIVISION
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Division of Civilian Supply
Priorities Division
Division of Contract Distribution
Production Division
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BULLARD

AEROPLANE engine builders, whose accuracy requirements exceed those of any other manufacturers, use more Bullard Vertical Turret Lathes than any other industry. Mult-Au-Matics, too, are a favorite with this and other industries because of the savings in time which they constantly produce.

Here are a few typical examples:

MACHINING A HUB

old time *47 minutes* Mult-Au-Matic time *6 minutes*

MACHINING AEROPLANE PROPELLER SPIDERS

old time *96 minutes* Mult-Au-Matic time *6 minutes*

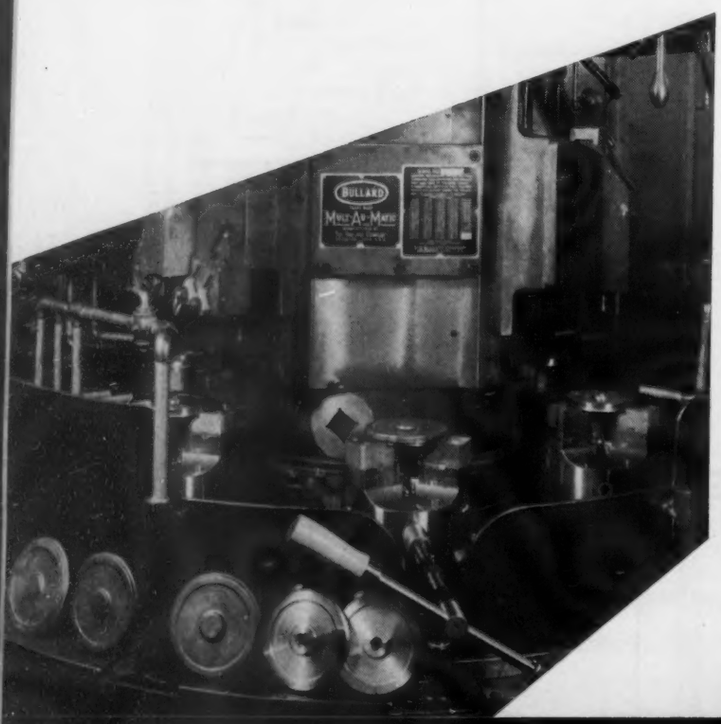
MACHINING ENGINE BARRELS

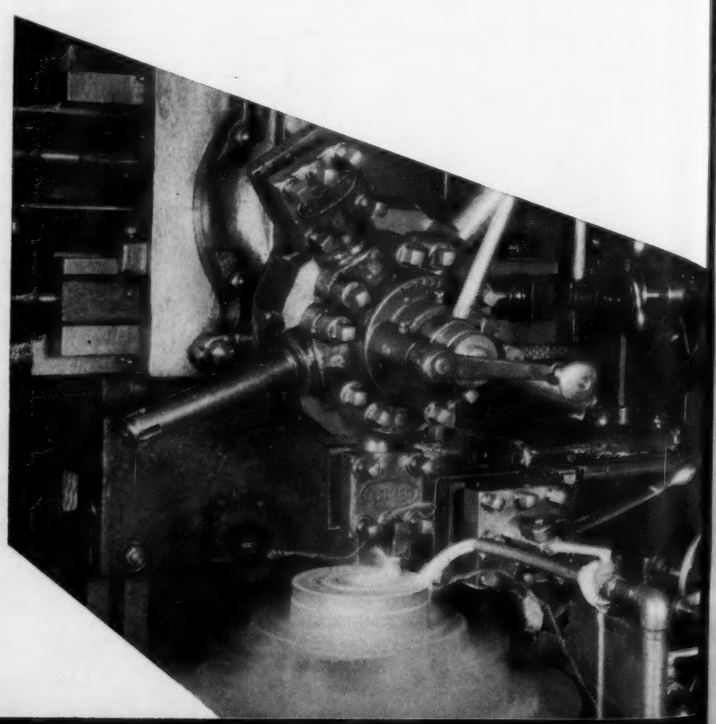
old time *168 minutes* Mult-Au-Matic time *22½ minutes*

MACHINING THE ARMS OF A THREE BLADE AEROPLANE PROPELLER HUB

old time *315 minutes* Mult-Au-Matic time *25 minutes*

Bullard Machines and Bullard Engineers will almost invariably show the way to unexpected production economies.





THE BULLARD COMPANY BRIDGEPORT, CONNECTICUT

Mirrors of *MOTORDOM*

No dancing in the streets despite Henderson pep talk. Labor, materials and priorities keep business men from concentrating on terpsichorean talents . . . Distribution and timing considered keys to logjam in materials . . . Change in shell steel specifications requires more heat treating equipment, but yields higher strengths in product . . . Talk blast furnace for Muskegon

By A. H. ALLEN
Detroit Editor, STEEL

DETROIT

■ WHY is there no "dancing in the streets" to celebrate the tremendous gains in industrial production since the defense program began? asked Leon Henderson, pudgy, cigar-smoking perpetual motion machine of the OPA and SPAB in an ironical address before the Economic Club here last week. Why do not "some of you red-blooded extroverted economic practitioners" jump with joy over these soaring production indices? he further asked.

Skipping the fact that Detroit streets are tough enough to drive in, let alone dance in, there are still potent reasons why business men are in anything but a dancing mood these days.

Problem No. 1 is labor which is still bound on bedeviling, berating and becalming all efforts at all-out production. There are the jurisdictional strikes such as that at the Hillsdale Steel Products division of Spicer Mfg. Corp., which has succeeded in tieing up vital parts needed in construction of tank transmissions. Military critics cry out at the slowness of tank production, and the government makes no move to settle petty incidents like the Spicer affair, where CIO workmen refuse to handle parts touched by AFL workmen.

Strikes Are Causing Shutdowns

There are strikes over reclassification of workmen, such as the one at Midland Steel Products Co. in Cleveland, which last week caused Hudson to close down its automobile lines completely here and send men home, which has caused Studebaker to shut down, and which shortly will affect Buick and possibly other car producers who depend on Midland for frames.

There are the slowdown strikes, such as at the Ford plant where the same force of workmen which last year could turn out 4125 cars in a day is now producing about 2500, the only reason being that they are slowing down purposely so they will not lose their jobs because of curtailment of car production. Picture, if you can, the effect on costs of a 50 per cent slowdown.

There is the Currier Lumber affair, which has received nationwide publicity, involving the government's rejection of a low bid on defense housing by this company because it has signed a CIO contract and has perfected a new type of prefabricated house requiring much less labor than conventional designs.

There is the threat of imminent major tieup in steel production at various plants throughout the country as a result of union demands for closed shops.

Problem No. 2 is materials. An official of General Motors has told friends privately that because of inability to obtain supplies of certain vital (but unnamed) materials, it may be necessary to suspend car production altogether after Dec. 1. At the same time inventories of other items are built up to tremendous levels, in some cases sufficient for the entire 1942 model season. Such a decidedly unbalanced condition isolates thousands of tons of steel, for example, which would normally go through fabricating operations and contribute to the flow of scrap which is vital to maintenance of steelmaking operations.

And every day the materials picture takes a different tack. At one minute there is no zinc, then there is some available for nondefense purposes. First there is plenty of copper, then all copper is going to be required for the defense program. And on the one hand the priorities division extends priority assistance to mining companies supplying copper from South America, while on the other hand price control authorities make no effort to extend price assistance to Michigan copper mines.

Auto companies now are forced to operate on a day-to-day basis as far as materials are concerned. One day it will be a shortage of certain sizes of hood-top steel sheets; then it will be a bottleneck in gear steel, and the next day something else.

Problem No. 3 is priorities. Here the picture is little short of ridiculous in spots. Assignment of priorities apparently is based on no carefully planned system but rather on how the official scanning an application happens to feel that day. For example, some steel for tote boxes in a new aircraft plant here, still in the structural stage, was given a rating of A-1-b, while the plant itself has only A-1-c. And again, an urgently needed heat treating furnace was assigned A-1-c, but the furnace builder could get nothing better than A-3 or thereabouts on parts and supplies needed to build furnace. To cap the climax, consider the case of a large steel company which received an order the other day for *one ton* of pig iron, priority A-1-a.

It is getting so that the crowd of orders with A-1 priorities is so thick suppliers are hopelessly confused trying to sort them out, and any buyer like the automobile industry with no priority to speak of just has to stand by and whistle.

Many Shortages Do Not Appear Genuine

Considered opinion around here is that the complete picture on materials has been seriously distorted, that actual shortages are not nearly so complicated as they have been made to appear. There is at the moment ample capacity to produce most everything for both defense and a reasonable amount of nondefense requirements. Distribution and timing are the two factors which have thrown the thing out of gear. Beyond these there is the basic matter of human selfishness. Every buyer is inclined to say, "Well, I've got to have a high priority and I've got to have the stuff right now. The devil

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with the other fellow; I'm out to protect myself."

Business and industry in this area, and not just the automobile industry, are not solidly behind the defense effort. They are doing the best they can, but they continually shake their collective heads over bungling at Washington. They see and ridicule the efforts of politicians to assume the stature of world statesmen—anxious to impress high-minded idealism on the world while refusing to take a definite stand on affairs at home.

These men who stand amazed at the confusion and stumbling in the nation's capitol are no diehard Republicans, still heckling the New Deal. Many of them will agree that the Republican party is dead and gone, that the only way to call the bluff of entrenched bureaucracy is to organize a new political regime—perhaps an All-American party—which will end internal hypocrisy before embarking on world adventures.

Behind the scenes Detroit seems fairly well convinced that an A.E.F. is only a matter of time to settle Europe's mess. The likely route of such a force probably will be via Africa where major bases can be set up and union effected with Weygand's forces there for the next step against the Mediterranean and on into Europe through Italy and Greece.

Change to Carbon Steel For Shell Manufacture

An important change in specifications for shell steel is causing a mild flurry here in view of the demands it imposes on new heat treating facilities. In the effort to obtain higher strengths and to conserve manganese, it has been proposed to change from a 1335 type of steel to, say, a 1045 heat treated. This serves to ease some of the pressure on steel mills, but it means at the same time that new heat treating furnaces and quenching equipment have to be installed, the heat treatment coming after the nosing operation. New quenching oils also have been developed to effect the proper quench on the heated shells. It is understood that the change is being planned to be in full effect by Dec. 1.

A large order for cast steel shells and bombs is to be handled by the Campbell, Wyant & Cannon Foundry Co. in Muskegon, Mich., where plans had been drawn up for a cupola-bessemer-electric furnace installation to supply around 350 tons a day. Since the likelihood of obtaining sufficient scrap for cupola operations on this basis has been growing dimmer and dimmer, and the price of low-phosphorus steel scrap laid down at Muskegon averages something like $27 a ton, the plans reportedly have been changed. Now it is understood a blast furnace will be built at Muskegon Heights, near the docks of a paper mill there, which are suitable for unloading of lake ore freighters. The furnace would have capacity of about 500 tons of iron a day, which would be transferred to the foundry over a company-owned railroad in hot metal cars. Then it would be blown in the bessemers and refined in the electric furnaces for subsequent casting operations.

According to comment locally, the furnace may be operated by Hickman-Williams & Co., with C-W-C supplying funds for its construction. Coal conceivably could be brought up from Illinois fields and across Lake Michigan to Muskegon for conversion to coke in new ovens to be built adjoining the blast furnace; or if it was decided not to build ovens, coke would have to be brought in from some outside source.

The plan appears to have much merit. Easily approachable by ore freighters, the Muskegon district is a thriving industrial center and the steadily expanding foundry operations of C-W-C intensify the pressure on raw materials. A blast furnace would relieve the pressure on scrap supply and might even provide a leeway for further extension of casting work, as well as helping out company plants at South Haven, Mich., and Lansing.

Pool Equipment for Defense

In the embryonic stages here is a production pooling plan being organized by Frank Rising of the Automotive Parts and Equipment Manufacturers Association in the interests of spreading a greater share of defense manufacturing among small plants in this district. A committee of production engineers has been assembled to prepare a survey of available facilities, the idea being then to integrate these facilities and go after major defense contracts which could be subdivided among the parts companies participating. The committee is working closely with Alex Taub, former Chevrolet engineer, who at present is in Washington seeking to stimulate subcontracting of defense manufacturing.

H. W. Anderson, General Motors Corp., told a Flint, Mich., mass meeting last week that the corporation hopes eventually to employ 25,000 more persons on defense work alone in the Flint district. GM has made a formal proposition for the manufacture of medium and heavy tanks at the Fisher Body and Buick divisions in Flint, which would require 15,000 workmen. Decision on this tank contract is expected within a few weeks.

Ford Planning Tanks

Ford is rushing plans for tank production and likely will build the same type of tank as now produced by Chrysler, except that assembly of main armor sections of hull will be by welding instead of riveting. Meanwhile Plymouth division of Chrysler has announced setting up of separate department in its plant for machining tank parts for both Chrysler arsenal and other tank builders. About 60 machines will be devoted to this work as well as to certain operations on parts for Bofors guns and Martin bombers.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1939	1940	1941
Jan.	356,962	449,492	524,058
Feb.	317,520	422,225	509,326
March	389,499	440,232	533,849
April	354,266	452,433	489,854
May	313,248	412,492	545,355
June	324,253	362,566	546,278
July	218,600	246,171	468,895
Aug.	103,343	89,866	164,792
8 mos.	2,377,691	2,875,477	3,782,440
Sept.	192,679	284,583	.....
Oct.	324,689	514,374	.....
Nov.	368,541	510,973	.....
Dec.	469,118	506,931	.....
Year	3,732,718	4,692,338	.....

Estimated by Ward's Reports

Week ended:	1941	1940†
Sept. 20	60,560	78,820
Sept. 27	78,535	95,990
Oct. 4	76,820	105,153
Oct. 11	79,065	107,957
Oct. 18	85,600	114,672

†Comparable week.

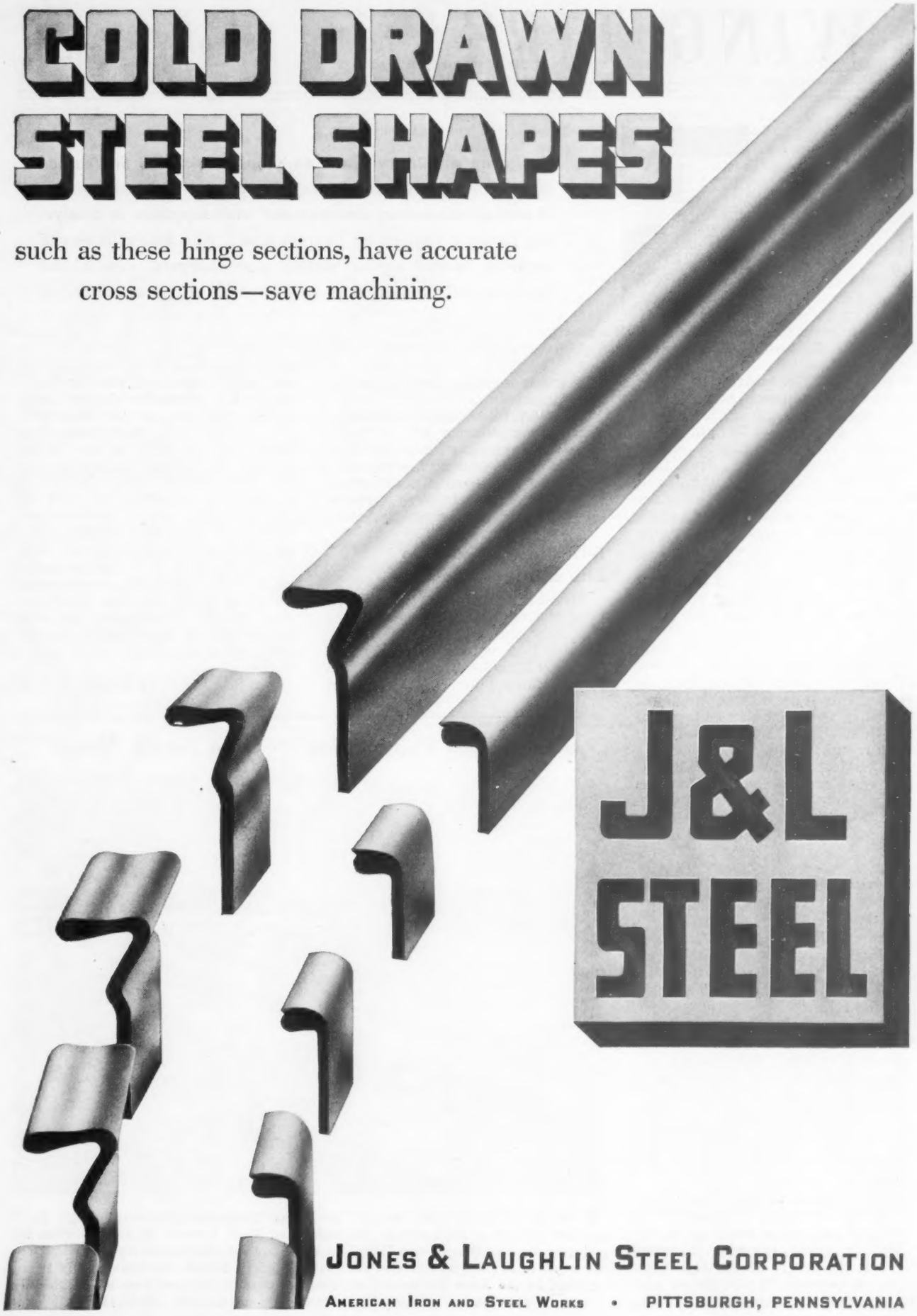
Reynolds To Build Third Aluminum Plant

■ Plans are being drawn for the third aluminum plant to be owned and operated by Reynolds Metals Co., according to R. S. Reynolds, president. It is to be located at Listerhill, Ala., in the Muscle Shoals district, where the company already owns and operates an alumina plant and an aluminum plant producing 40,000,000 pounds of virgin aluminum a year. The company also operates a rolling mill, producing aluminum sheets at the Listerhill site. The new aluminum plant is expected to increase Reynolds' aluminum production to 160,000,000 pounds a year.

The third plant, like the other two now in operation, will be entirely owned by the company. The first two were financed by government loans that held as security the company's entire 18 plants operating at the time the first loan was made in 1940.

COLD DRAWN STEEL SHAPES

such as these hinge sections, have accurate cross sections—save machining.

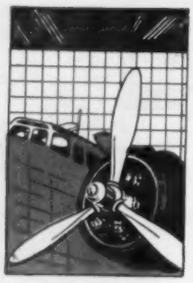


J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS • PITTSBURGH, PENNSYLVANIA

WING TIPS



Designing a military plane no simple task. . . . Engines of higher horsepower permit stepping up size of bombers. . . . Materials laboratory co-operates with suppliers in analyzing failures, suggesting improvements. . . . Study improved controls, sealed cabins, better superchargers, new airfoil sections and stainless steel coverings for planes of tomorrow

■ REFERENCE to drawing up designs for a new plane, mentioned in previous installment of this discussion of activities at Wright Field, Dayton, O., sounds like a simple matter. Actually it is far from that.

Consider some of the things the designer must do: Select the engines to give the horsepower required by specifications, determine how many will be used and where they will be placed, prepare a weight estimate of the aircraft including all essentials except the structure itself, solve the problems of wing area and selection of an airfoil section (curve of the wing from leading edge to trailing edge), determine the platform of the wing (tapered, elliptical or rectangular), decide the angle of the wing, then make an estimate of the total weight. Now he can start to draw up the design.

So he proceeds to wrestle with the matter of making use of every inch of space consistent with movement of crew and ability to operate equipment. When he works out placements of engines, crew and equipment in relation to their functions, he can develop his fuselage plan and draw in the undercarriage and tail unit.

Shall he have a double tail fin or a single type? If a double type, what about the blind spots on either side of a rear gunner? If a single fin, where shall he put the gunner, if any?

And there is the matter of balance. A careful schedule is prepared, showing the weight of each item and the distance from its center of gravity to a selected reference point on the plane. This table then can be used to compute the center of gravity of the plane, minus the wing.

Next, where to spot the wing? Problems of flying characteristics, stability and vision must be adjudicated. In general the wing is located so that the center of gravity of the plane is between 25 and 30 per cent of the distance between the leading and trailing edges, back from the leading edge.

At about this stage the designer can start making a set of three-view drawings showing as much detail as possible about the construction and dimensions of his creation, if he is still able to keep his eyes open and his fingers nimble.

B-17 Bomber Grows to B-15 and Then to B-19

An example of how one design evolves from another is seen in the fact that the giant 212-foot wingspread B-19 bomber recently test flown by Douglas on the West Coast is an enlarged version of the present largest bomber of the Air Corps, the B-15, a 150-foot wingspread ship which holds present world records for load-carrying and long-range flight. And the B-15 in turn is one step in size and development beyond the first four-motored monoplane bombers of the Army, the B-17 flying fortresses, now in quantity production in their fifth redesign, and called the B-17-E. Actually the B-19, or the XB-19 as it should be called since it is strictly an experimental model or prototype, was made possible by the development of 2000-horsepower engines which did not exist when the B-15's were taking shape.

Wright Field to many is best

Light Metal Planes May Become Aerial "Jeeps"

■ **Sturdy, all-metal light aircraft, like these Luscombe Silvercaire planes lined up for tests on a field outside the factory at West Trenton, N. J., may soon be adopted as a possible aerial "jeep" for important scouting and ferry service. Only light plane of its type manufactured in the United States, the Silvercaire is being studied by the Army because of its all-metal construction and because it is easily maneuvered and serviced, lands in a small field. NEA photo**

known as the Materiel Division of the Army Air Corps. It is organized as a group of sections. One of these is the Experimental Engineering Section, consisting of eight "laboratories" — power plants, aircraft equipment, materials, propellers, photographic, armament and aircraft radio.

Of these, the equipment laboratory is one of the largest, since under it come procurement and testing of the thousand and one items other than actual planes necessary to maintaining a crack air corps—parachutes, helmets, flying uniforms, instruments, rubber boats and the like. Also under this laboratory is a new aeromedical research unit devoted to study of the effects of flight on human beings. As high-altitude flying becomes more general and as talk of supersonic speeds in airplanes appears closer to reality the findings of this medical unit are of great importance.

Concentrate on Fatigue Failures in Metals

Closest perhaps to the metalworking industries is the materials laboratory, for years and still under direction of the well-known engineer and metallurgist, J. B. Johnson. Here surveillance is given to all types of materials used in aircraft, activity being broken down into several sublaboratories—metals, plastics, textiles, rubber, fuel and oil, and paints and finishes. The materials specialists work in close conjunction with industry on most efficient utilization of these materials and also carry on continuous studies of service failures of materials.

As far as metals are concerned, failures are 90 per cent attributable to fatigue or protracted alternating stresses resulting from vibration, so naturally much of the laboratory's work is aimed at fatigue studies. Standard types of metallurgical and metallographic equipment are operated daily in routine tests of all sorts.

The metals laboratory also carries on extensive tests in its cold room at temperature down to −40 degrees Fahr. A general observation voiced by R. R. Kennedy, in charge of metals tests, is that both stainless steel and aluminum alloys appear to show somewhat improved properties at low temperatures, while carbon steels are somewhat inferior in performance.

Valuable data on corrosion phenomena are obtained by tests supervised by metals laboratory engineers on samples exposed at tidewater locations.

Primary source of propeller engineering data is the Wright Field propeller laboratory which operates the largest propeller test rig in the world, capable of whirling propellers up to 45 feet in length at speeds up to 4300 r.p.m. This laboratory also co-operates with the Navy Department and the Department of Commerce in this testing work.

The Materiel Division, in effect, maintains full supervision over the designing, purchasing, follow-up, delivery and servicing of Air Corps planes. Major servicing is conducted by the nine Air Corps depots throughout the country, and island possessions, two of them having been recently constructed. Plans are under way for a broad expansion of servicing activities, but they will be based at these nine depots, with subsidiary personnel, equipment and supplies tied in with them and involving in all a projected staff of roughly 40,000.

Although procurement for the Air Corps is centralized at Wright Field, with overall supervision at Washington, there are three district procurement offices—east, central and west. The central office is now located at Detroit. All three work in close cooperation with the production engineering section at the field.

Many Ideas for Future Now on Drawing Boards

While major emphasis now is concentrated on production of warplanes and speeding up deliveries, this is not to infer that Wright Field engineers can find no time to look ahead to planes of the future. What are some of the ideas which may find application in such new planes? Here are a few, some of which are already on designers' drafting boards, or even in production:

1. Improved controls which have less lag and permit more accurate formation flying.

2. Sealed cabins, in which air pressure can be built up to facilitate high-altitude flying.

3. Better superchargers to increase "ceilings." The exhaust-driven turbosupercharger, which increases in speed as external air pressure decreases, is one type which is seeing service.

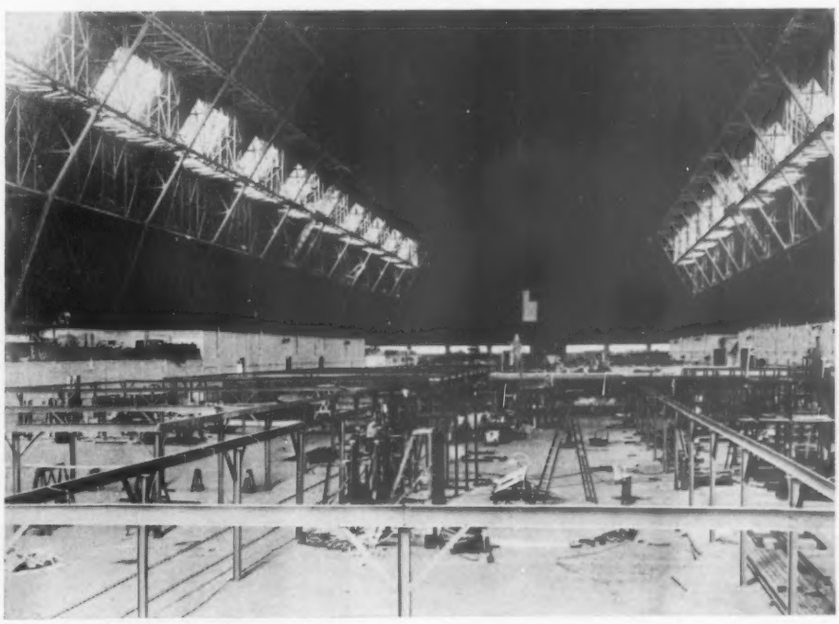
4. New airfoil sections, such as the laminar flow wing. This is a development originating with the National Advisory Committee for Aeronautics' research laboratories at Langley Field, Va., but naturally Wright Field engineers are co-operating on similar advanced ideas.

5. Stainless steel for wings and fuselages. Engineers appear in unanimous agreement that the future for stainless steel in aircraft looks particularly bright.

Briggs Receives Large Order

Preliminary order for $23,000,000 worth of power-driven airplane gun turrets has been awarded to Briggs Mfg. Co., supplementing an educational order received last August for $3,250,000. The turrets are now in production in a Briggs experimental plant in Detroit, but funds have been granted for a new plant to cost $8,000,000.

Airship Dock 1175 Feet Long, Covers 8½ Acres



■ **Eight and one-half acres of floor space is encompassed under this expansive roof of the gigantic Goodyear airship dock in Akron, O., devoted to manufacturing aircraft assemblies. The photo was taken from one end of the 1175-foot long building in which more than 2000 already are employed by Goodyear Aircraft Corp., working on contracts for Martin, Consolidated, Curtiss-Wright and Grumman**

MEN of INDUSTRY

■ **W. C. SAYLE,** since 1914 vice president and general manager, Cleveland Punch & Shear Works Co., Cleveland, has been elected president to succeed his father, the late Walter D. Sayle. Mr. Sayle has been associated with the company 30 years.

♦

J. T. Hively has been appointed director of public relations, Denison Engineering Co., Columbus, O. Mr. Hively formerly was president, J. T. Hively Oil Co., Columbus.

♦

George W. Huggett has been elected president and managing director, Canadian Industries Ltd., Montreal, Que., succeeding the late Arthur B. Purvis.

♦

A. W. Thomas has been appointed sales manager, Construction Machinery Division, Chain Belt Co., Milwaukee, while **D. A. Kalton** has been made assistant sales manager, and **A. J. Frank,** assistant to the manager of the division. Mr. Thomas, formerly assistant sales manager, succeeds **B. F. Devine,** recently promoted to manager of that division.

G. K. Viall recently was placed in charge of the company's newly organized Division of Research and Development.

♦

I. S. Kurtz, since 1932 assistant works manager, Alameda, Calif., plant of Bethlehem Steel Co., has become works manager. He succeeds the late Alexander B. Charlton.

♦

Reginald B. Taylor has resigned as vice president, Niagara Share Corp., to become associated with Sterling Engine Co., Buffalo, as vice president and assistant treasurer. Mr. Taylor will head the company's newly created priorities division.

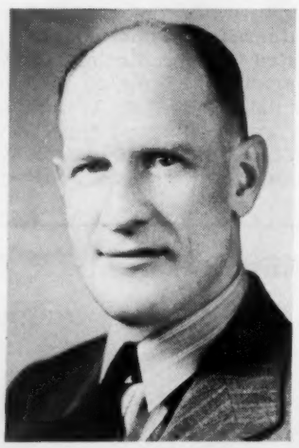
♦

Donald O. Scott, president and general manager, Bendix Home Appliances Inc., South Bend, Ind., since the company's organization in 1936, has resigned to engage in other activities. **Judson S. Sayre,** vice president in charge of sales, succeeds Mr. Scott as president.

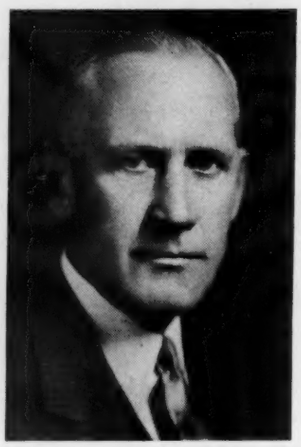
♦

P. N. Guthrie Jr., formerly president of Reading Iron Co., Reading, Pa., now in liquidation, has joined S. C. Marx and associates in Allied Metal Products & Supplies Corp., New York, exporter and importer. Mr. Guthrie will handle the company's steel business.

W. C. Sayle



A. W. Thomas



Harry L. Bill
Who has been elected vice president and general manager, Greenfield Tap & Die Corp., Greenfield, Mass., as announced in STEEL, Oct. 13, page 80

♦

George V. Mea has been promoted to manager of the farm and industrial equipment office of International Harvester Co. in Buffalo. He succeeds **Henry W. Martin,** who has become manager of the company's Albany, N. Y., branch.

♦

Thomas A. Jordan, since 1930 assistant engineer in charge of design, American Bridge Co., Chicago, has been named assistant division engineer. He succeeds **F. W. Dencer,** who has retired after 40 years of continuous service.

♦

Stanley Bracken, engineer of manufacture, Western Electric Co., New York, has been appointed to a new position of general manufacture manager, necessitated by great increase in production. Mr. Bracken has been with Western Electric 29 years.

♦

Earl C. Maund has joined the Chicago office of Manning, Maxwell & Moore Inc., in a sales and engineering capacity. He formerly was associated with Sinclair Refining Co. at East Chicago, Ind., and with Cities Service Oil Co., at Shreveport, La.

♦

George G. Main, since 1938 associated with the office of the president, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed assistant director, financial accounts division, while **Wencel A. Neumann Jr.** has been appointed to the office of the president, succeeding Mr. Main.

♦

Harry J. Lehman has been appointed district manager in Providence, R. I., for Bridgeport Brass Co., Bridgeport, Conn., with offices at 70 Clifford street. He succeeds the late H. B. Whitaker. **Alfred V. Archer** will continue in charge of the Providence warehouse, and will also become a sales representative.

♦

Frank A. Burnett has been transferred from the Cincinnati office of Ampco Metal Inc., Milwaukee, to

Indianapolis, with headquarters at 3335 Colgate avenue. **E. A. Svoboda,** heretofore located at Indianapolis, will take charge of Ampco's Cleveland office, replacing **J. A. Morrison,** resigned. **Russell E. Campbell** has joined the West coast division of the company and will work with **O. D. Cooper.**

♦

Bruce R. Prentice has been appointed engineer, Aeronautics Equipment Division, General Electric Co., Schenectady, N. Y., while **Kenneth K. Bowman** has been made assistant engineer of that division; **Harley H. Bixler,** mechanical engineer on special assignments, and **Laurence R. Leveen,** administrative assistant in the Ordnance Control Division.

♦

J. Richard Barton has been elected vice president, Chrysler New York Co. Inc., New York, succeeding **Frank Wiethoff,** who was recently elected president upon retirement of **William D. Stewart,** president since the company was formed in 1936. Prior to his recent appointment, Mr. Barton was an executive of the Chrysler Sales Division, with headquarters in Detroit.

♦

C. E. Walsh Jr., the past 15 years associated with Bethlehem Steel Co., Bethlehem, Pa., and specializing recently in purchasing materials for Bethlehem's shipbuilding plant at Sparrows Point, Md., has been appointed chief of the newly created procurement section of the United States Maritime Commission's construction division. He will be in charge of purchasing all materials for construction of Liberty ships, and also much of the material for other ships authorized under the supplementary appropriation act of last August.

♦

Carl L. Wallfred has joined the technical staff of the division of process-metallury research at Battelle Memorial Institute, Columbus, O. Mr. Wallfred has had 20 years' experience in chemical and metallurgical research with the United States Bureau of Mines, Northwest Research Foundation and Mines Experiment Station, University of Minnesota, the Minnesota Mining & Mfg. Co., and A. O. Smith Corp.

♦

Dr. Champion H. Mathewson, widely known metallurgist and metallurgy department head, Yale University, New Haven, Conn., was honored upon the occasion of his sixtieth birthday recently by 115 members of the Yale Metallurgical Alumni. He was presented a commemoratory volume containing 19 technical papers on physical metallurgy especially prepared by Yale metallurgy graduates in his honor.

♦

H. F. Robertson has been appointed district manager of the New England office and warehouse of Jessop Steel Co. at 626 Capitol avenue, Hartford, Conn., succeeding the late Hugh A. Scallen.

Other changes in the Jessop sales organization follow:

J. W. Stranahan, formerly Cleveland representative, has been transferred to Philadelphia. **Paul R. Wendt,** heretofore Cleveland representative, is now associated with the Toronto office, while **H. Preston Berry** has been transferred from the plant in Washington, Pa., to do special sales work at Chicago.

♦

Fred C. Wood has been named manager, air conditioning department, York Ice Machinery Corp., York, Pa. He joined the company as a student engineer in 1928.

The advertising department of York has been combined with the sales promotion department, with **Anker Winther,** assistant general sales manager, in charge.

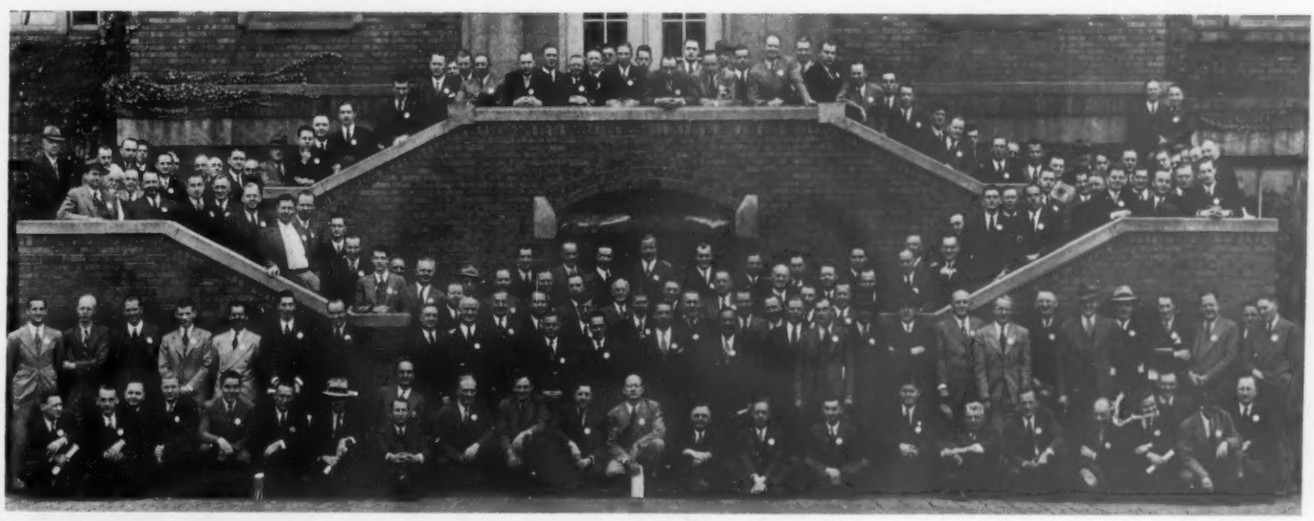
J. L. Rosenmiller has been placed in charge of the newly created accessory equipment and maintenance department, which includes all the personnel of the former service department and the accessory equipment and supplies division.

♦

T. J. Connor, vice president, Caterpillar Tractor Co., Peoria, Ill., has been assigned general supervision of the industrial relations department and training and public relations department, in addition to the departments of manufacturing, engineering and purchasing, which he previously administered.

T. R. Farley, vice president, has been assigned direction of the parts and service departments, in addition to direction of the merchandise department. Supervision of the traffic department, formerly conducted by Mr. Farley, has been assigned to **William Blackie,** controller.

Members of Porcelain Enamel Institute at Sixth Annual Forum



■ **One hundred ninety foremen and supervisors attended the Porcelain Enamel Institute's sixth annual forum at Ohio State University, Columbus, O., recently. The forum committee has been enlarged to consist of F. E. Hodek Jr., General Porcelain Enamel & Mfg. Co., Chicago, chairman; Prof. R. M. King, Ohio State University; Dr. A. I. Andrews, University of Illinois, Urbana, Ill.; J. E. Hansen, Ferro Enamel Corp., Cleveland; N. G. Wedmeyer, Rohm & Haas Co., Philadelphia and C. V. Given, Great Lakes Steel Co., Ecorse, Mich., the latter two being new members**

Aircraft Engine Awards Comprise 80% of Army's Orders in Week

■ TWO contracts, placed with Ford Motor Co., Dearborn, Mich., and Studebaker Corp., South Bend, Ind., comprised more than 80 per cent of $317,204,356 national defense awards reported last week by the War Department.

Ford Motor Co. received a $182,955,559 order for aircraft engines and spare parts. Approved by OPM, this contract covers manufacture of Pratt & Whitney type engines which have been manufactured by Ford under license from United Aircraft Corp.'s Pratt & Whitney Division.

Studebaker's contract, for $74,338,783, was for additional Wright Aeronautical-type engines, to be manufactured in factories constructed under Emergency Plant Facility contracts previously awarded. Engines will be manufactured under license from Wright Aeronautical Corp.

Yoder Co., Cleveland, was awarded a $7,200,000 contract for a new 57-millimeter antitank gun, parts for which are to be supplied by nearly 40 subcontractors. The new gun, originally designed in England, has been redesigned by Yoder Co.

Other defense contracts reported in the week by the War Department included:

Ordnance Department Awards

Ahlberg Bearing Co., Chicago, roller bearings, $3387.42.
Aluminum Co. of America, Massena, N. Y., wire, $14,840.
American Locomotive Co., New York, volute spring suspensions, $3879.90.
Andre, J. Harold, Davenport, Iowa, seamless steel tubing, $2927.48.
Baker, M. W., Co., Bryn Mawr, Pa., projectiles, $183,000.
Belmet Products Inc., Brooklyn, N. Y., tubes, $17,112.
Bilgram Gear & Machine Works Inc., Philadelphia, machinery, $4925.
Bliss, E. W., Co., Brooklyn, N. Y., hydraulic heading presses, $14,724.
Bliss & Laughlin Inc., Buffalo, steel, $2724.73.
Carnegie-Illinois Steel Corp., Chicago, steel, $11,923.50.
Chase Brass & Copper Co. Inc., Waterbury, Conn., brass sheets, $2760.09.
Collis Co., Clinton, Iowa, parts for tanks, $2209.35.
Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., accelerators, components for revolvers, $50,460.
Columbus Forge & Iron Co., Columbus, O., forgings, $2329.47.
Crosby Steam Gage & Valve Co., Boston, gages, $4165.25.
Crucible Steel Co. of America, New York, steel, $3159.93.
Cushman Chuck Co., Hartford, Conn., chucks, $7400.
Detroit Seamless Steel Tube Co., Dearborn, Mich., steel, $5485.19.
Englewood Plumbing Supply Co., Englewood, N. J., pipes, $5928.67.
Federal Machinery Co., Chicago, presses, $11,882.
General American Transportation Corp., Chicago, shells, $239,000.
General Motors Sales Corp., New Departure Division, Bristol, Conn., bearings, $2914.51.
General Steel Castings Corp., Eddystone, Pa., parts for gun carriages, $2,600,000.
Haarman Steel Co., Holyoke, Mass., steel, 53066.
Hampden Brass Co., Springfield, Mass., bronze castings, $13,768.30.
Haskins, R. G., Co., Chicago, tapping equipment and motors for pumps, $8820.
Hayes, Charles E., Co., Springfield, Mass., cable, $2575.
Heller Bros. Co., Newark, N. J., files, $1852.36.
Heppenstall Co., Pittsburgh, die blocks, $2625.15.
Hoover Co., North Canton, O., fuzes, $1,984,000.
Industrial Stamping & Mfg. Co., Detroit, cartridge holder chutes, $5124.30.
Inland Steel Co., Chicago, steel, $791,700.
International Machine Tool Corp., Indianapolis, electric motors, $11,696.
International Nickel Co. Inc., New York, forgings, $81,105.30.
J. C. H. Automatic Machine Works, Philadelphia, dial plates and punch and die holders, $4326.25.
Jerrold, G. O., New York, steel, $13,370.
Landers, Frary & Clark, New Britain, Conn., fuzes, $860,000.
Leitelt Bros., Chicago, castings, $2499.70.
Letts Drop Forge Inc., Detroit, forgings, $5428.51.
Lowell Wrench Co., Worcester, Mass., wrenches, $3655.
Lyon Metal Products Inc., Davenport, Iowa, shelving, $16,874.80.
Machinery Mfg. Co., Los Angeles, milling machines, $4350.
Manning, Maxwell & Moore Inc., Bridgeport, Conn., gage hand jacks, gages, $12,720.
McGill Mfg. Co., Valparaiso, Ind., ball bearings, $2887.50.
McKiernan-Terry Corp., Dover, N. J., staking machines, $485,330.
Morse Tool Co., Detroit, cutting tools, $857,451.65.
Murchey Machine & Tool Co., Detroit, die heads and chasers, $2311.
Niles-Bement-Pond Co., Pratt & Whitney Division, Hartford, Conn., drill tips, gage blocks, $7080.
North & Judd Mfg. Co., New Britain, Conn., buckles and slides, $2774.25.
Ohio Seamless Tube Co., Shelby, O., seamless steel tubing, $2658.50.
Otis Steel Co., Cleveland, steel, $2480.48.
Peck, Stow & Wilcox Co., Southington, Conn., hammers, $2041.20.
Poor & Co., Canton Forge & Axle Works, Canton, O., steel forgings, $2408.52.
Porter-McLeod Machine Tool Co. Inc., Hatfield, Mass., lathes, $3577.50.
Pratt & Letchworth Co. Inc., Buffalo, castings, yokes, hoop cranks, $28,839.10.
Production Tool & Die Co. Inc., Springfield, Mass., fixtures, $2250.
Read Machinery Co., York, Pa., shells, $620,775.
Republic Steel Corp., Cleveland, steel, $151,243.39.
Revere Copper & Brass Inc., New York, brass discs, $4551.68.
Rockford Machine Tool Co., Rockford, Ill., shapers, $5951.
Safe Guard Corp., Lansdale, Pa., dies, $4380.
Sampsel Time Control Inc., Spring Valley, Ill., rivets, $6525.40.
Schauer Machine Co., Cincinnati, lathes, $4516.38.
Schutz O'Neill Co., Minneapolis, pulverizers, $9150.
Sheffield Corp., Dayton, O., gages, $4386.02.
Shipley, W. E., Machinery Co., Philadelphia, automatic screw machine, cut-

Giant Missile of Destruction

■ **Soldiers of the 79th field artillery, only regiment in the United States Army equipped with the 240-millimeter howitzer, operate the traveling crane which carries 345-pound shell to the breech. The howitzer is mobile, being drawn in five sections by 10-ton tractors. NEA photo**

ter and tool grinders, $13,864.
Simplex Wire & Cable Co., Cambridge, Mass., cable, $2225.16.
Smith & Wesson Inc., Springfield, Mass., components for revolvers, $19,565.
Sperry Gyroscope Co. Inc., Brooklyn, N. Y., cams and fuzes, $36,097.
Stockham Pipe Fittings Co., Birmingham, Ala., shells, $271,260.
Taylor-Wharton Iron & Steel Co., High Bridge, N. J., steel, $354,888.
Torrington Mfg. Co., Torrington, Conn., milling cutters, $4129.
Turner Brass Works, Sycamore, Ill., blowtorches, $4311.50.
Unexcelled Mfg. Co., New York, flares, $1,462,500.
Universal-Cyclops Steel Corp., Titusville, Pa., steel, $2362.75.
Van Norman Machine Tool Co., Springfield, Mass., milling machines, $5287.
Veit & Young, Philadelphia, ejecting stems, $13,980.
Western Cartridge Co., Winchester Repeating Arms Co. Division, New Haven, Conn., cartridges, $11,232.
West Haven Foundry Co., West Haven, Conn., bronze hammers, $6037.20.
Wood, John, Mfg. Inc., Muskegon, Mich., parts for gun recoil mechanisms, $124,204.70.
Zimmerman Steel Co., Bettendorf, Iowa, steel castings, $4168.03.

Air Corps Awards

Abrams, Talbert, Lansing, Mich., printer assemblies, $190,684.
Acklin Stamping Co., Toledo, O., airplane mooring parts, $12,450.
Adams & Westlake Co., Elkhart, Ind., adapter assemblies, $65,051.50.
Air Associates Inc., Bendix, N. J., aircraft fittings, $25,092.
Aluminum Co. of America, Pittsburgh, aluminum alloy rivets, $56,941.50.
American Chain & Cable Co. Inc., Automotive & Aircraft Division, Detroit, cable equipment, $256,832.
Baker Raulang Co., Industrial Truck Division, Cleveland, electric trucks, $77,730.
Bell Aircraft Corp., Buffalo, tool kits, $208,928.
Bell & Howell Co., Chicago, cameras, $82,368.
Bendix Aviation Corp., Bendix Products Division, South Bend, Ind., motor, valve and charger assemblies, maintenance parts, carburetor assemblies and spare parts, brake, wheel, cylinder and generator assemblies, $887,243.73; Eclipse Aviation Division, Bendix, N. J., pump, valve, solenoid and switch and resistor assemblies, inverters, $208,890; Pioneer Instrument Division, Bendix, N. J., instruments, $66,645.
Breeze Corporations Inc., Newark, N. J., aircraft fittings, $6510.
Butler Mfg. Co., Kansas City, Mo., portable hangars, $283,320.
Cleveland Pneumatic Tool Co., Cleveland, high pressure air pumps, $75,000.
Crosley Corp., Cincinnati, bolt and bracket assemblies, $51,566.
Curtiss-Wright Corp., Buffalo, maintenance parts for airplanes, $53,368.
Dietzgen, Eugene, Co., Chicago, compasses and dividers, $354,670.
Douglas Aircraft Co. Inc., Santa Monica, Calif., cowlings, $155,532.
Duplex Truck Co., Lansing, Mich., generator sets, $83,472.
Electric Auto Lite Co., Moto-Meter Gauge & Equipment Division, LaCrosse, Wis., gages, $356,735.
Electric Storage Battery Co., Philadelphia, storage batteries, $706,985.
Elgin National Watch Co., Elgin, Ill., clocks, $160,667.75.
Engelhard, Charles, Inc., Newark, N. J., indicator assemblies, $360,036.75.
General Electric Co., Schenectady, N. Y., generator assemblies and inverters, instruments, $1,714,250.
General Motors Corp., Indianapolis, tools, $159,461.
Graybar Electric Co. Inc., Dayton, O., fuses, $22,691.
Harrisburg Steel Corp., Harrisburg, Pa., gas cylinders, $2,951,980.
Heald Machine Co., Worcester, Mass., boring machines, $142,699.
Holley Carburetor Co., Detroit, carburetors and spare parts, $23,298.
Holtzer-Cabot Electric Co., Boston, inverters and various maintenance parts, $587,390.
Homelite Corp., Port Chester, N. Y., portable electric power plant units, $461,400.
International Harvester Export Co., Chicago, refueling trucks, $199,476.
Keystone Trailer & Equipment Co., Kansas City, Mo., trailers and dolly converters, $467,729.
Kidde, Walter, & Co. Inc., New York, fire extinguisher equipment, $319,243.40.
Kinsey, E. A., Co. Inc., Dayton, O., milling machines, $105,172.
Kline Mfg. Co., Columbus, O., windlass assemblies, $100,800.
Lawson Mfg. Co., Pittsburgh, stand assemblies, $150,056.55.
Link Aviation Devices Inc., Binghamton, N. Y., sextants, $78,125.
Mallory, P. R., & Co. Inc., Indianapolis, release assemblies, $468,000.
Manning, Maxwell & Moore Inc., Bridgeport, Conn., maintenance parts and data, $71,785.
North American Aviation Inc., Inglewood, Calif., flexible cells and installation parts for gun compartments, $153,450.
Ohio Pattern Works & Foundry Co., Cincinnati, aircraft fittings, $34,714.
Parker Appliance Co., Cleveland, aircraft fittings, $70,047.
Rockford Screw Products Co., Rockford, Ill., flat head and taper pins, $27,803.06.
Screw Machine Products Co. Inc., Providence, R. I., aircraft fittings, $10,403.
Seifreat-Elstad Machinery Co., Dayton, O., milling machines, $92,175.
Sparks-Withington Co., Jackson, Mich., airplane mooring parts release assemblies, $540,205.
Sperry Gyroscope Co. Inc., Brooklyn, N. Y., aircraft equipment, $152,400.
Standard Aircraft Products Inc., Dayton, O., lamp assemblies and reflectors, $238,998.
Stewart-Warner Corp., Chicago, portable ground heaters, $567,000.
Taylor-Wharton Iron & Steel Co., Easton, Pa., gas cylinders, $1,493,458.
United Aircraft Corp., Pratt & Whitney Aircraft Division, East Hartford, Conn., engine tools, $192,688.74.
United-Carr Fastener Corp., Cambridge, Mass., snap, ring, socket fasteners, $58,806.33.
United States Gauge Co., New York, gages, $150,960.
U. S. Department of Agriculture, Forestry Service, Washington, steel towers, $110,000.
Vultee Aircraft Inc., Downey, Calif., gas tanks, $490,000.
Wadell Engineering Co., Newark, N. J., boring machines, $203,490.
Weatherhead Co., Cleveland, aircraft fittings, $15,646.
Westinghouse Electric & Mfg. Co., Dayton, O., ammeter and voltmeter assemblies, $145,326.
Weston Electric Instrument Corp., Newark, N. J., instruments, $123,921.
Wright Aeronautical Corp., Paterson, N. J., generator assemblies, $284,509.50.

Signal Corps Awards

American Automatic Electric Sales Co., Chicago, ringing converters, switchboard equipment, $231,846.67.
American Electrical Heater Co., Detroit, soldering irons, $5625.
Andrew's Machine & Pattern Co., New York, lance poles, $57,240.
Belden Mfg. Co., Chicago, cable, $3300.
Bell & Howell Co., Chicago, motion pic-

Handling TNT at Kankakee Ordnance Works

■ **Filling paper-lined boxes with TNT in the "flaking house" of the Kankakee Ordnance Works, near Joliet, Ill., is expedited and made safe and easier for the operator by the handling system shown here. The box sets on a scale and 50 pounds of the explosive, flowing down the chute, is put into each container. Machine at the extreme right is a "vibrator", and shakes the TNT to box level. From this point the box is carried down a long, enclosed chute to the nailing house. NEA photo**

ture projectors, lamps, lens, $28,055.31.
Benwood Linze Co., St. Louis, rectifiers, switches, connectors, capacitors, $37,687.03.
Climax Engineering Co., Clinton, Iowa, power units, $149,050.
Clough-Brengle Co., Chicago, signal generators, $3984.16.
Connecticut Telephone & Electric Co., Meriden, Conn., telephones, $6937.
Cook Electric Co., Chicago, frames, protector blocks, heat coils, jacks, $31,821.71.
Cornelius, H. M., Co., New York, tool equipment, staples, $25,682.
Cummins Diesel Engine Corp., New York, power units, $214,564.88.
Ehrick, Fred, Co., Brooklyn, N. Y., rolls, $21,896.
Electric Storage Battery Co., Philadelphia, batteries, $8518.80.
Ferris Instrument Corp., Boonton, N. J., microvolters, $180,375.26.
Fischer, Charles, Spring Co., Brooklyn, N. Y., casing, shafting, sleeves, nuts, $21,425.
Friez, Julien P., & Sons, Kearny, N. J., clinometers, $3316.50.
General Cable Corp., New York, telephone cable, $94,640.
Graybar Electric Co. Inc., New York, cable, reels, rectifiers, trailers, switchboards, rollers, $627,740.95.
Karp Metal Products Inc., Brooklyn, N. Y., boxes, $19,984.
Kellogg Switchboard & Supply Co., Chicago, switchboards, cabinets and cases, plugs, $174,611.20.
Leich Electric Co., Genoa, Ill., switchboards, $6062.
Lundquist Tool & Mfg. Co., Worcester, Mass., reel control boxes, cover and switch plates, connectors, $96,509.50.
Medco Mfg. & Distributing Co. Inc., Sheboygan, Wis., power units, $9225.
Mitchell Camera Corp., West Hollywood, Calif., theodolites, $254,512.
Murdock, Wm. J., Co., Chelsea, Mass., headsets and receivers, $19,809.
Parish Pressed Steel Co., Reading, Pa., reels, $104,800.
Precision Mfg. Co., North Chicago, Ill., ground rods, $10,800.
Ray-O-Vac Co., Madison, Wis., batteries, $5020.
Remler Co. Ltd., San Francisco, plugs, $76,472.50.
Richardson Rod & Reel Co., Chicago, antennae, $78,100.
Small Motors Inc., Chicago, dynamotor units, $109,005.20.
Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., switchboards, $5503.35.
Supreme Instrument Corp., Greenwood, Miss., analyzers, oscillators, tube and set checkers and oscilloscopes, $106,377.98.
Triplett Electrical Instrument Co., Bluffton, O., test sets, $445,766.
Utilities Service Co., Allentown, Pa., clamps and steps, $3059.38.
Western Electric Co. Inc., Kearny, N. J., cases, cord and panels, $31,023.81.
Western Trailer Co., Los Angeles, lofts, $52,680.
Westinghouse Electric & Mfg. Co., New York, rectifiers, ceiling light projectors, $36,436.66.
Weston Electrical Instrument Co., Newark, N. J., ammeters, $127,057.68.
White, David, Co., Milwaukee, theodolites and tripods, $88,305.

Corps of Engineers Awards

American Chain & Cable Co. Inc., New York, wire rope, $5996.
Chicago Pneumatic Tool Co., Los Angeles, compression riveters, aircraft assembly plant, Ft. Worth, Tex., $10,000.
Cleveland Pneumatic Tool Co., Cleveland, compression riveters, aircraft assembly plant, Ft. Worth, Tex., $48,000.
Manhattan Boiler & Equipment Co., New York, boiler, accessories, and replacement box, $4971.
Niles-Bement-Pond Co., Pratt & Whitney Division, Los Angeles, vertical shapers, aircraft assembly plant, Ft. Worth, Tex., $5147.50.
Pacific Flush Tank Co., Chicago, rotary distributors and siphons, advanced single engine flying school, Moultrie, Ga., $5935.
Penn, H. O., Machinery Co. Inc., New York, diesel electric sets, spare generator and replacement parts, $39,202.68.
Phillips, I. W., & Co., Tampa, Fla., nails, MacDill field, Florida, $2981.75.
Pioneer Engineering Works Inc., Minneapolis, rock crushing plant and replacement parts, $7245.13.
Pomona Pump Co. Inc., New York, pumping units, $8937.
Radiomarine Corp. of America, New York, radio equipment, $2860.
Ric-Wil Co., Cleveland, underground prefabricated steam conduit and fittings, Scott field, Illinois, $2601.80.
Savory Inc., Newark, N. J., toasters, Biloxi, Miss., training school, $4141.20.
Standard Transformer Co., Warren, O., transformer, Patterson field, Ohio, $5100.
Sterling Motors Corp., Long Island City, N. Y., tractor chassis, tanks, platform bodies, trailers, and replacement parts, $62,913.32.
United States Pipe & Foundry Co., Birmingham, Ala., cast iron pipe, Tyndall field, Panama City, Fla., $10,376.80.
Wallace & Tiernan Co. Inc., Newark, N. J., chlorinating equipment, MacDill field, Florida, $3082.

Quartermaster Corps Awards

Coleman Lamp & Stove Co., Wichita, Kans., gasoline lanterns and mantles, $3876.
Delta Electric Co., Marion, Ind., lanterns, $2085.
General Motors Corp., Chevrolet Division, Tarrytown, N. Y., 1½ and ¾-ton trucks, $257,767.65.
Schrade Cutlery Co., Walden, N. Y., pocket knives, $5238.

Engineers Corps Awards

Chicago Bridge & Iron Co., Houston, Tex., elevated steel water tank, $51,265.
Elifeldt Hardware & Machinery Supply Co., Kansas City, Mo., surface grinders, $5260.50.
Imperial Electrical Supply Co., Brooklyn, N. Y., cables and wire, $5743.
Layne-Central Co., Memphis, Tenn., well, pump, motor, and pumphouse, $15,490.

Steel Igloos for Soldiers in Iceland

■ **American marines and British soldiers working together building huts of galvanized steel and wood in preparation for the winter in Iceland. Photo passed by British censor**

Distribution Office Lists Contract Opportunities

■ Contract opportunities for items required in the defense program, issued last week by the Contract Distribution Division and not heretofore published in STEEL, were for prime contracts and primarily for small quantities of widely varying products. Among opportunities issued by the Navy's Bureau of Supply and Accounts and the Army's Air Corps were the following:

Bidding forms on any of these schedules should be obtained by wiring, mentioning schedule number, to the Bureau of Supplies and Accounts, Navy Department, Washington. QR refers to quantity required.

8989—Nuts, steel, hexagon, misc. from ¼"—20 to 3"—8 in quantities of 50 to 1,000,000; bids Oct. 30.

8967—Irons, hand and leg. QR-1820; bids Oct. 30.

8925—Cuprous-oxide, dry, in metal drums containing about 220-lbs. QR-200,000 lbs.; bids Oct. 23.

8940—Buckets, iron, galvanized, QR-75,000; bids Oct. 28.

8971—Screws, sheet-metal, self tapping, round head, nominal diameter $\frac{3}{16}$-inch, length ¾-inch. QR-1200 gross; bids Oct. 30.

8983—Cans, paint, tin. QR-large; bids Oct. 30.

8978 — Punch, flange, horizontal, motor driven. QR-1; bids Oct. 28.

8977—Cans, ash and garbage, steel. QR-37,000; bids Oct. 30.

9001—Chain, cast steel and dielock. QR-14; bids Oct. 28.

8957—Closers, door, liquid, type 3001. QR-4292; bids Oct. 30.

8988—Buoys, mooring, steel. QR-20; bids Oct. 28.

8982—Anchors, cast steel, weight 15,000

(*Please turn to Page* 113)

Canadian Government's War-Time Wage Regulations

Foiling Agitators, Curbing Inflation

Order-in-Council prescribes 1926-40 maximum rate as ceiling . . . Cost of living bonus provided to protect employes against price increases

TORONTO, ONT.

■ SATISFYING labor has been one of the major problems, and also the weakest link in Canada's all-out war effort.

In recent months a number of important disputes have occurred in key industries, interrupting their production and forcing related plants to suspend or reduce operations.

With the object of curtailing such disputes, the Canadian government passed the Order-in-Council (P.C. 7440) to establish a war-time wage policy as an integral part of economic control. This was done last June and the order, applying to all government work, went into effect immediately. Remarkable as it may seem, however, it was not until recent weeks that it received much publicity in Canada. The question now arises whether the order is accomplishing its object.

While no figures are available it has become apparent that the act is exerting a beneficial influence.

First, the number of strikes and the number of persons involved have diminished.

Second, the great majority of strikes now are due not to disputes over wages, but to union organization efforts.

Third, as a result of public satisfaction over the government's wage policy, the opportunities for the agitators have greatly decreased. Workers and public generally are regarding the labor organizer and agitator as a public enemy. More and more the provisions of the act are being applied by other than those working for government account in the war effort.

The act undoubtedly is tending to prevent a runaway inflation.

The Order-in-Council contains two main provisions—(a) Except in certain special circumstances, the highest wage rates established between 1926 and Dec. 16, 1940, are to be regarded as fair and reasonable; they may be restored, if necessary, and maintained but not increased; (b) Such wage rates may be supplemented by a separate cost of living bonus usually of $1.25 per week for each rise of 5 per cent in the cost of living in order to safeguard the workers against increases in the cost of basic necessities of life.

Explaining the new Order-in-Council, Norman A. McLarty, minister of labor, presented the following facts pertaining to labor and wages in Canada:

Average money wage rates are higher today than they have ever been in Canadian history, with the exception of 1920. In the latter year wages were some 2 per cent higher, with the cost of living 50 per cent above the current rate. Today's wage rates are about 4 per cent higher than in 1929 with cost of living 10 per cent lower. Employment

■ **Women munitions workers in one of Canada's arsenals in Quebec continue their careful, methodical inspection of cartridges as W. L. Mackenzie King, prime minister of Canada, visits the plant. Production in this arsenal, it is reported, has been "tremendously increased in the past year." Ammunition output in two days is said to be greater than would have been possible in six months at the rate in effect a year ago. NEA photo passed by Canadian censor**

is at an all time peak, 23 per cent above 1929. Higher wages, more employment and substantial overtime pay means that money earnings of wage earners are at the highest level ever reached in Canada. Payrolls in March of this year were about 54 per cent above those of 1939. Wage earners of Canada, despite the heavy burden of taxation and of savings, are better off now than they have ever been before.

Although the government is controlling and taxing profits, there are protests against P.C. 7440, which is said to permit profiteering. The government discredits these allegations, stating that taxes on corporation profits range from a minimum of 40 per cent on total profits to a maximum of between 80 and 89 per cent of excess profits. In 1939 such taxes amounted to about $78,000,000. This year they are expected to yield $385,000,000, considerably more than total dividends paid in recent years. In addition, when profits are paid out in dividends they are subject to further heavy taxation under the personal income tax.

Order-in-Council P.C. 7440 does three things. It sets a ceiling on wage rates, but at the highest level ever reached in this country. It sets a floor below which wages may not fall. It provides the cost of living bonuses to protect the workers' basic standard of living from being undermined by increases in the cost of living.

Following are provisions of the Order-in-Council, P.C. 7440:

1. Minimum wage standards established by provincial law or regulation shall be regarded as minimum standards only.

2. Wage rates established and in effect at the date hereof ought not to be reduced by reason of any principle herein set out.

3. The wage rate paid by the employer during the period 1926-29, or higher level established thereafter but prior to Dec. 16, 1940, shall be considered generally fair and reasonable, except when it is clearly shown that such wage rate level was or is unduly low or subnormal, in which event a board may recommend such rates as it considers fair and reasonable.

4. If the present wage rate level established by the employer is lower than the wage rate level established during the period 1926-29, or higher level established thereafter but prior to Dec. 16, 1940, and it is clearly shown that such previous wage rate levels, if restored, would be unduly enhanced or abnormal, any increase in present wage rates in any calendar year shall be limited to 5 per cent thereof.

5. A war-time cost-of-living bonus separate from and in addition to basic wage rates shall be paid except for good cause shown to the contrary to all employes as follows:

(a) Such bonus shall be based on the cost-of-living index prepared by the Dominion Bureau of Statistics for the Dominion as a whole.

(b) The increase shall be measured from August, 1939, or from the effective date (subsequent to August, 1939) of the granting of the last previous increase in wage rates or bonus, which brought the wage rate level (including any bonus other than a cost of living bonus pursuant to the provision of this section) of the employer up to a fair and reasonable level.

(c) The bonus shall be paid in the first instance only if the cost of living has risen by as much as 5 per cent; thereafter the bonus shall be increased only if the cost of living has risen by 5 per cent or more and three months have elapsed since the last previous determination of the amount of the bonus, or decreased only if the cost of living has fallen by 5 per cent or more and three months have elapsed since the last previous determination of the amount of the bonus.

(d) Subject to the provisions of the last preceding subsection, for each rise of 1 per cent in the cost of living the amount of the bonus shall be 25 cents per week, except for male workers under 21 years of age and female workers, who, if employed at basic rates of less than 50 cents an hour on jobs which by custom or practice are not ordinarily assigned to adult male workers, shall receive a bonus of 1 per cent of their basic wage rates.

In preparing the cost-of-living index, August, 1939, is taken to equal 100. From that time until Sept. 30, 1941, the index shows a gain of 13.8 per cent, which would indicate bonus payments at this time amounting to $3.50 per week. Following is the index trend:

Aug., 1939	100.0	April, 1941	107.7
Jan., 1940	103.0	May, 1941	108.5
June, 1940	104.1	June, 1941	109.6
Jan., 1941	107.4	July, 1941	111.0
Feb., 1941	107.3	Aug., 1941	112.8
Mar., 1941	107.3	Sept., 1941	113.8

■ **Mountain climbers in Canada: Even the rugged barriers of the Rocky Mountain foothills fail to halt these little machines, constructed in Canadian automotive plants. NEA photo**

Canada is dipping deep into her reserves of labor to man the ever expanding war industries, and has extended labor training programs to an extent never before realized in the Dominion's history. Since the outbreak of war, in addition to the thousands of men who have enlisted in the active forces, Canada has added nearly 300,000 workers to industry and almost all who were employable are now employed. It is believed that another 300,000 workers will be needed in industry before March, 1942. At the end of last July, 1,574,866 persons were employed in Canadian industry.

Hon. C. D. Howe, minister of munitions and supply, dealing with Canada's war industry stated: "As we enter the third year of the war, industry faces its greatest test—to expand production in spite of the fact that more and more men will be needed in the armed forces. The problem of the government is to keep balance between the needs of the forces in terms of equipment, and needs of the forces in terms of men."

How Steel Demand May Lag While War Machine Speeds Up, from Britain's Experience

Civilian uses curtailed, armament plants unable to take all material available . . . Controls extended . . . New labor regulations adopted

By VINCENT DELPORT
STEEL'S European Editor

LONDON

■ REQUIREMENTS for raw steel in Great Britain have decreased moderately since early summer.

The interpretation of this fact is to be found in measures taken to concentrate on war production and maintenance of plant and equipment required for such purpose.

These plants are in full production and are absorbing all the steel they can use. Meanwhile, the manufacture of civilian products has practically ceased. The large tonnages of steel normally used for buildings, automobiles and peace-time products are not required. War products do not call for such large quantities. Furthermore, restrictions on exports have dried up another source of demand for steel.

The result, of course, is all in favor of the war effort; essential deliveries have improved, stocks of raw materials have increased, and imports have been reduced, while steelworks' potential capacity has not been impaired.

Steps have been taken the past few months, during which time there has been little disturbance to production or transport due to enemy action, toward further organizing production and directing the flow of materials and stores. The iron and steel industry has come in for additional control.

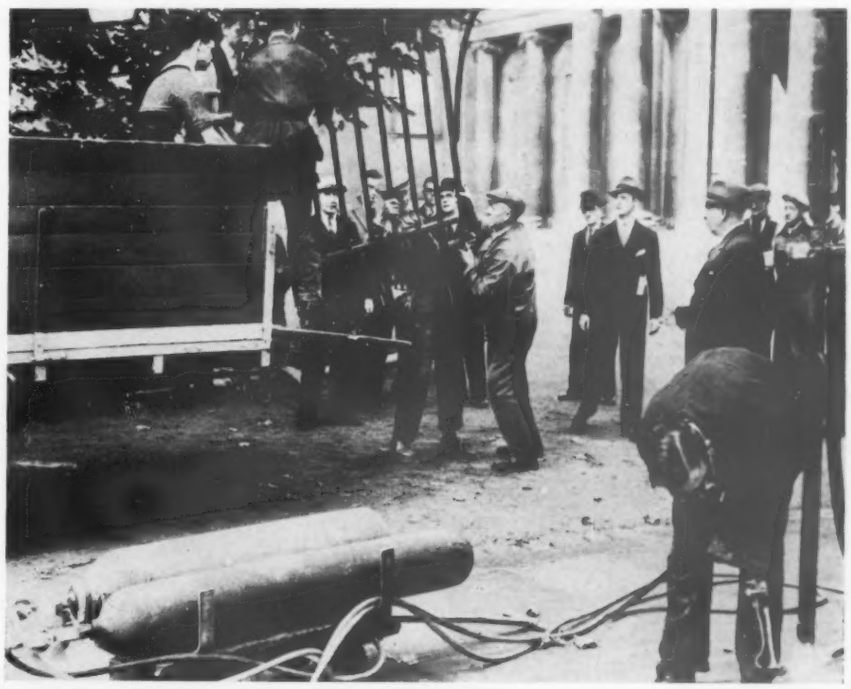
So far the supply of iron and steel products was regulated mainly through distribution of raw materials, and rules that permitted manufacturers to execute orders only after they had obtained a license for each individual order or contract.

Certain iron and steel products were not included in these regulations. In July the rules were modified to incorporate in the scheme all iron products, except pig iron, but including iron castings. The measure was to take effect Oct. 1.

Another alteration was to prohibit the treatment, use and consumption, without authority, of iron and steel in the production, repair or maintenance of articles not controlled under the order—meaning ordinary articles for civilian use. Certain limited quantities of materials were scheduled, which could be bought by any customer from stockholding merchants without license.

To summarize, the amended procedure is as follows: All acquisitions of iron (not including pig iron) and steel, as defined in the general schedule, whether for direct government contracts or for any other purpose, and whether bought from a producer or from a stockholding merchant must be authorized on a specified form—the only exception being for small specified quantities of certain articles.

Authorizations come directly from the government departments concerned. The general schedule includes all ordinary steel products, wrought iron and iron castings. Provision is made for the holder of an authorization, for the contract or



■ **Iron fences and gates at Buckingham Palace were cut down recently and carted away as scrap. Mr. Delport reports: "There is no actual shortage of scrap, although the position . . . is tight at certain isolated points." Photo passed by British censor**

purpose named on the form, to issue subauthorizations to other subcontracting firms for any part of the tonnage.

Stockholding merchants wanting iron and steel for their stock can acquire it only under license from the Iron & Steel Control, not from government departments. If a producer of iron and steel wants to acquire material to convert it into other forms, he also must obtain the authority from the Iron & Steel Control. No one may treat, use or consume any material mentioned in the schedule otherwise than for the purpose named on the form, unless specially permitted to do so in exceptional cases.

The latter condition applies equally to manufacturers making articles from iron and steel produced at their own works, or requiring the steel for the maintenance and repair of their own plant. Obviously, under these regulations, iron and steel cannot be sold in almost any form unless the authorization form for its use is presented by the purchaser. If iron and steel is required for export, an authorization must be obtained from the Board of Trade or from the Colonial Office in the case of colonial territory.

A further step was taken in August, when a new scheme was set up under the Essential Work (General Provisions) Order, 1941, which controls the labor supply. Normal machinery of the Ministry of Labor is being supplemented by local executive committees with a central co-ordinating committee known as the Central Labor Supply (Iron & Steel) Committee. Each local committee comprises an officer of the Ministry of Labor as chairman and representatives of employers and workers, not to exceed three in each case, who are nominated by the Ministry of Supply after consultation with organizations of employers and workers concerned. Each area organization of the Ministry of Supply has a representative on the Local Committee, and the secretary is an officer of the Ministry of Labor.

These local committees will deal with substantial demands for labor expected to arise from bringing new plants into operation, working additional shifts, etc. Undertakings must notify the local office of the Ministry of Labor of all workers in excess of their immediate requirements, and the Local Labor Supply Committee must be notified of any appreciable short-time working, either actual or prospective.

Protective Measures Taken

This strict control over production and consumption of iron and steel explains why certain sections which are not adapted to the manufacture of war products have had their activities substantially reduced. In some cases works are to close down and their labor and any useful plant and equipment will be taken over by so-called "nucleus" undertakings now completely keyed up to war manufacture. Necessary measures are being taken to protect the goodwill and trade marks of firms compelled to close.

In viewing these measures that so completely interfere with normal conditions of ownership and management, it must be realized that the British nation is faced with a totalitarian war and it was felt that only by voluntarily accepting totalitarian methods would such a war be won.

The supply position in Great Britain is satisfactory, except for certain products like hematite pig iron, which is being largely replaced by special refined irons. Coke supplies are sufficient although coal output as a whole is not up to expectations. Output of domestic iron ore has made tremendous strides since the beginning of the war.

There is no actual shortage of scrap, although the position is tight at certain isolated points, but in view of the reduction of imports from the United States, a fresh campaign has been started to collect scrap all over the country.

Russia's industrial losses in the Ukraine, including plants and mines, have been a heavy blow to that country, although Russia still has abundant supplies of iron ore at the east end of Crimea, in the Caucasus and in Siberia, and the greater part of her iron and steelworks is disseminated at various places, right into Siberia.

Despite attempts at sabotage and despite conditions of forced labor, Germany is intensifying her war production not only in her own works but in those industrial countries she now controls.

News received through the Belgian government agency in London indicates that industrial production in Belgium is seriously curtailed owing to shortage of coal, the reason given being passive resistance on the part of the miners.

Hardly a week passes without reports from France, Poland, Bohemia-Moravia to the effect that the Germans are operating the controlled works in those countries under the greatest difficulties, but there is little doubt that the resources of those countries are effectively put to contribution to the advancement of Germany's war aims. Reports from Sweden indicate great activity in iron and steel for defense purposes and that exports are going mainly to Russia and Finland.

■ **General view in one of the large tank building factories "somewhere in England." Tank production is now in full swing in various parts of the country, the Ministry of Supply announces. Photo passed by British censor**

Industrial Gear Sales Lower in September

■ September sales of industrial gears were 12 per cent below the August level, although 32.8 per cent higher than in September, 1940, according to the American Gear Manufacturers Association, Wilkinsburg, Pa. For the nine months ended with September, 1941 sales were 97.7 per cent greater than in the comparable 1940 period.

The association's figures do not include automotive gears or gears used in high speed turbine drives.

Construction To Drop 25 Per Cent In 1942, Is OPM Research Report

■ PRESSURE of priorities and allocations, which will divert the use of materials from nondefense to defense uses, will curtail new construction in the United States and outlying possessions in 1942 to approximately $8,500,000,000. This estimate is based upon a comparison of civilian and military needs for next year made by economists of the OPM Bureau of Research and Statistics.

The figure represents a decline of approximately one-fourth from the estimated $11,200,000,000 in construction activity expected for the current year. The previous peak as measured by dollar value occurred in 1927 when the construction value rose to $10,948,000,000. OPM economists point out that the probable construction activity for 1942 would be greater than the 1940 figure of $6,850,000,000.

The estimate for 1941 indicates that defense construction will account for approximately 44 per cent of all building, whereas in 1942 the proportion of defense construction will rise to more than 75 per cent. Defense work next year is expected to employ an average of 1,300,000 men throughout the year, with 1,500,000 or more at peak periods. The average is about 30 per cent greater than the estimated average for 1941.

If the number of residential units constructed in 1942 drops by 200,000 next year, the decline in employment is estimated roughly at around 120,000 man-years, and, since the type of building affected probably will be the more expensive home construction, a tentative estimate of the amount by which dollar value will decline is placed between $800,000,000 and $1,000,000,000.

Decline in Employment Expected

Industrial expansion for nondefense purposes also is expected to drop sharply. The possible decline is from $500,000,000 in 1941 to $100,000,000 in 1942. Public utility construction is expected to fall abruptly as maximum use is to be made of present facilities in many instances.

Farm construction probably will not decline but may actually rise as it did in 1918, the survey indicates. Construction of highways may drop. Other public and miscellaneous construction is expected to decline, so that the volume of nondefense construction in 1942 may not exceed $2,000,000,000.

This suggests an average employment on private construction of about 400,000. If about 400,000 more men are added for maintenance, repair and remodeling, the total employed in nondefense construction would add up to approximately 800,000, a drop of more than half.

Average employment on construction work, including maintenance, repair and remodeling for both defense and nondefense, would be approximately 2,100,000 in 1942, according to these estimates. This would represent a decline of 22 per cent from the estimated average employment on construction of 2,700,000 estimated for 1941.

This study indicates that construction workers in many communities will be very hard hit, although those in other localities will benefit by the shift in activity. Building workers, it is pointed out, as a rule are more mobile than industrial or commercial employes. It is also pointed out that construction employment is greater than at any time since 1930, and that a decline in 1942 would be from a peak. It is also noted that there will be a large and growing demand for workers in shipbuilding in 1942, so that the employment opportunities for construction workers will be better than at any time since 1930. The OPM study estimates that private construction will continue at a high level for the remainder of 1941.

Railroads To Face Severe Test in Meeting Autumn Demands for Cars

■ DEFENSE program requirements during the next few weeks will provide a severe test for the country's transportation facilities and anticipated larger shipments next year may create a temporary transportation shortage by October, 1942. These are the conclusions of a study of transportation facilities by the National Association of Manufacturers.

The appraisal is the first of five, others will cover electric power, steel, strategic materials and petroleum.

The association found the bulk of the burden rested upon the railroads, normally carrying two-thirds of the freight traffic of the country, and that the entire defense program may be impaired in 1942 unless freight car and locomotive builders can obtain a constant flow of steel.

Inability of the railroad freight car builders to obtain steel, the association said, is the most disturbing factor in the transportation problem, and the forecast reports the goal of 1,800,000 total ownership of freight cars—including 160,000 new freight cars—by Oct. 1, 1942 may fall short by 100,000 cars.

Standardization of freight car specifications would mean a saving to the steel industry and increase the per day output of manufacturers. A study of a large freight car shop showed the company could produce 40 cars per day on an order of 10,000 identical cars and that the same shop's production would fall to 18 cars per work day on random orders of 200 cars.

One bright spot in the transportation picture is the high record of efficiency attained by the railroads in 1940 and 1941. Average amount of freight carried per train has increased from 804 tons in 1929 to 849 tons in 1940 and average speed of freight trains set a new high mark. Freight locomotives, the report said, attained a new high mark in average daily mileage and utilization obtained from freight cars was higher.

The association found one of the most serious handicaps to quick movement of freight was the idleness of cars. The average freight car, it found, moves 2½ hours out of every 24. This idle time, it said, reflects the months when much freight equipment stands idle. It also includes delays in loading and unloading and time spent in classification yards.

The report pointed out the past decade has been one in which many railway lines found business unprofitable and serviceable supplies of freight cars and locomotives were permitted to dwindle. The decreases, it said, "were entirely logical in view of the surplus of rolling stock during the depression years and the major improvements in railroad operations permitted larger traffic movement with fewer cars and locomotives."

The problem of providing for the abnormal demand arising out of defense and rearmament, said the association, is a transient one and once it is over much freight traffic will revert to its normal peacetime channels. "During this adjustment existing transportation facilities might prove more than adequate."

STEEL

Social Gains—Real or Imaginary?

■ EVERY now and then a spokesman for the present government administration mentions the social gains of the past eight years and emphasizes the desirability of retaining them. At one time President Roosevelt stated that these gains should not be sacrificed in the present emergency.

It may be well to look at these so-called gains critically. No doubt some of them are real, but on the other hand some may be imaginary—just as "paper profits" sometimes are imaginary.

• • •

This raises a question of definition. What is a real gain?

If a man were successful in slipping up behind another man on a dark street, stunning him with a blackjack and removing $100 from his wallet, he would be ahead by that amount and in certain respects it would be accurate to say that the $100 represents a gain to him.

However, few persons would argue that this is a real gain or one of which the gainer should be proud.

Again, if a man were reckless enough to buy an automobile or a house he could not afford, his temporary possession of the car or home would appear to be a gain.

However, that gain would not become real unless or until he had demonstrated his ability to pay for it and maintain it.

Hitler has acquired Denmark, Poland, Belgium, Holland and other countries. He counts them as gains.

But are they real gains? No; and they will not be unless or until the people in these countries choose of their own free will to live under Hitler's rule.

Thus a gain is not real if it has been acquired unjustly by force or recklessly by borrowing too heavily from the future.

When this yardstick of reason is applied to the social gains of recent years, some of them cannot be counted real.

For example, the Wagner act and everything that has happened under its provisions are referred to as great gains for labor.

Everything that the unions have gained by force—meaning intimidation or coercion—is a false gain and ultimately will be lost. In the end labor will hold only the gains it wins by the merit of its cause.

Social security in all of its phases is a real gain only to the extent that this nation can demonstrate its ability to afford it. Practically everything we have done for the so-called underprivileged has been done with money borrowed from the fruit of toil of future generations.

These gains are not real. They will not be real unless and until our children and our children's children have accepted the obligation and demonstrated their ability to discharge it.

• • •

If the present administration really wishes to preserve its gains—to turn "paper gains" into real gains—it could start by removing the coercive features of the Wagner act and reducing the non-defense expenditures of government.

Otherwise the sincerity of the administration in its social objectives will continue to be questioned.

E. L. Shaner

EDITOR-IN-CHIEF

Oct. 20, 1941

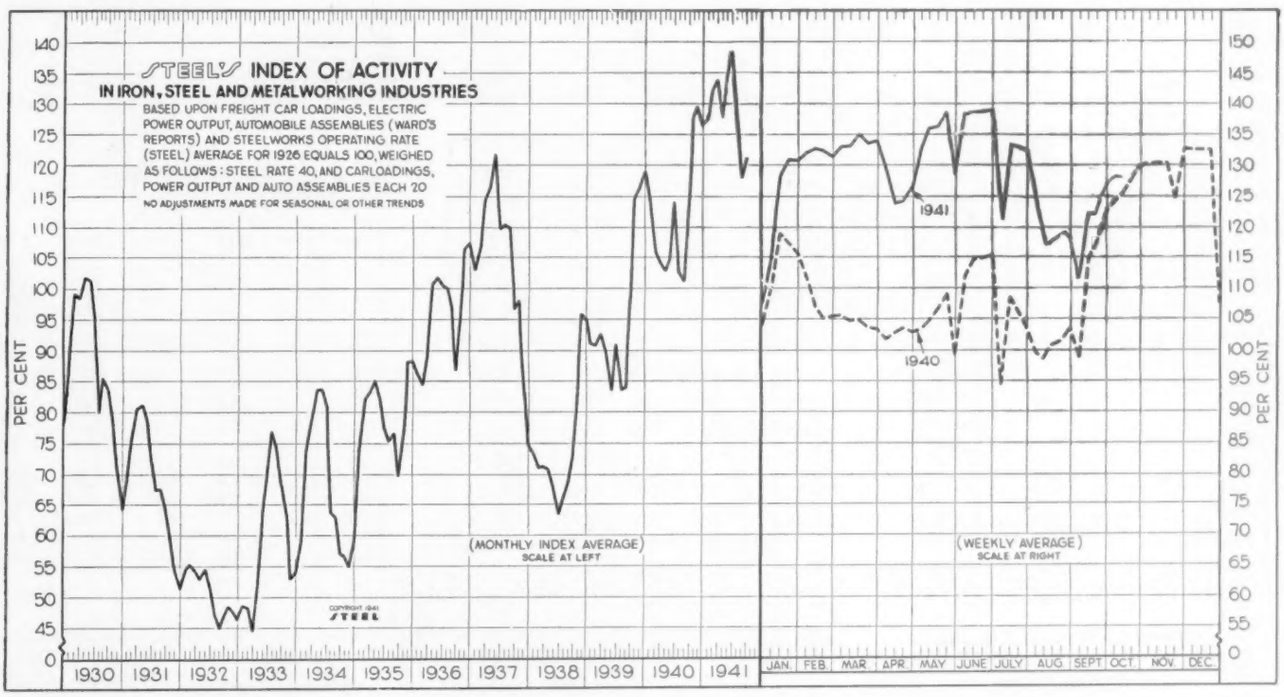
The *BUSINESS TREND*

Industrial Activity Leveling Off

■ A FLATTENING out of industrial production is indicated for the near future. Capacity operations have already been reached in most defense lines while output of numerous civilian goods industries has been curtailed due to shortages of raw materials and changeover to defense production. However, after the present dislocation ends, industrial output should reach a new high plateau.

STEEL'S index of activity eased 0.1 point to 127.9 during the week ended Oct. 11. Electric power consumption climbed to a new all-time high and automobile output recorded a slight increase, but these gains were offset by a moderate decline in the national steelmaking rate and in revenue freight carloadings.

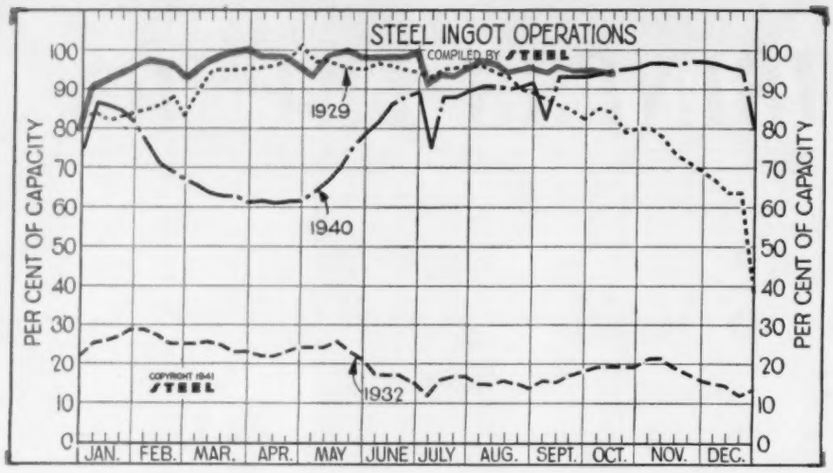
It appears probable that rationing of raw materials, already in effect in the distribution of some metals, will be extended to cover other strategic materials. An increasing number of Washington officials are against a further extension of the priorities system and are concentrating their efforts to reduce the spread of priorities unemployment. A real effort is being made to remedy the unbalanced inventory situation that is said to now exist in some instances.


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL) AVERAGE FOR 1926 EQUALS 100, WEIGHED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
NO ADJUSTMENTS MADE FOR SEASONAL OR OTHER TRENDS
PER CENT
1941
1940
(MONTHLY INDEX AVERAGE) SCALE AT LEFT
(WEEKLY AVERAGE) SCALE AT RIGHT
1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

STEEL'S index of activity declined 0.1 *point to* 127.9 *in the week ended Oct.* 11:

Week Ended	1941	1940
July 26	132.9	103.4
Aug. 2	123.3	99.7
Aug. 9	117.5	98.4
Aug. 16	118.2	100.8
Aug. 23	118.5	101.4
Aug. 30	118.2	103.5
Sept. 6	111.8	98.7
Sept. 13	122.3	114.9
Sept. 20	122.9	124.4
Sept. 27	127.5	122.8
Oct. 4	128.0	124.4
Oct. 11	127.9	126.0

Mo. Data	1941	1940	1939	1938	1937	1936	1935	1934	1933	1932	1931	1930
Jan.	127.3	114.7	91.1	73.3	102.9	85.9	74.2	58.8	48.6	54.6	69.1	87.6
Feb.	132.3	105.8	90.8	71.1	106.8	84.3	82.0	73.9	48.2	55.3	75.5	99.2
March	133.9	104.1	92.6	71.2	114.4	87.7	83.1	78.9	44.5	54.2	80.4	98.5
April	127.2	102.7	89.8	70.8	116.6	100.8	85.0	83.6	52.4	52.8	81.0	101.7
May	134.8	104.6	83.4	67.4	121.7	101.8	81.8	83.7	63.5	54.8	78.6	101.2
June	138.7	114.1	90.9	63.4	109.9	100.3	77.4	80.6	70.3	51.4	72.1	95.8
July	128.7	102.4	83.5	66.2	110.4	100.1	75.3	63.7	77.1	47.1	67.3	79.9
Aug.	118.1	101.1	83.9	68.7	110.0	97.1	76.7	63.0	74.1	45.0	67.4	85.4
Sept.	121.1	113.5	98.0	72.5	96.8	86.7	69.7	56.9	68.0	46.5	64.3	83.7
Oct.	.....	127.8	114.9	83.6	98.1	94.8	77.0	56.4	63.1	48.4	59.2	78.8
Nov.	.....	129.5	116.2	95.9	84.1	106.4	88.1	54.9	52.8	47.5	54.4	71.0
Dec.	.....	126.3	118.9	95.1	74.7	107.6	88.2	58.9	54.0	46.2	51.3	64.3



Steel Ingot Operations

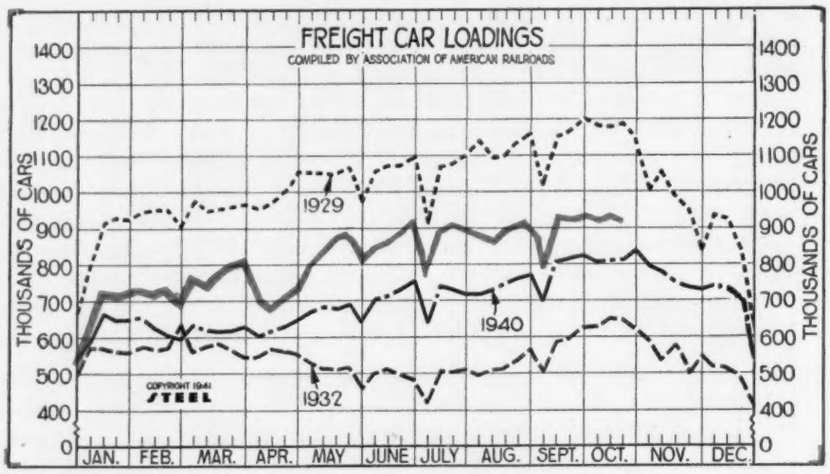
(Per Cent)

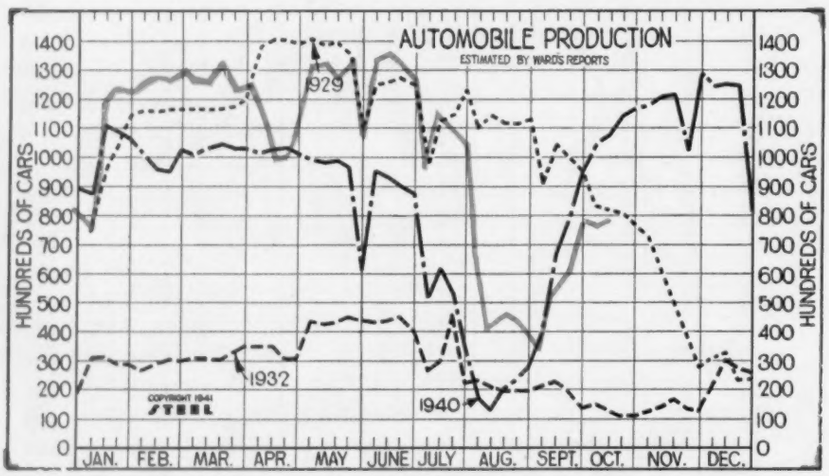
Week ended	1941	1940	1939	1938
Oct. 11	94.5	94.5	89.5	51.5
Oct. 4	96.0	93.5	87.5	48.5
Sept. 27	96.0	93.0	84.0	47.0
Sept. 20	96.0	93.0	79.5	48.0
Sept. 13	96.5	93.0	74.0	46.0
Sept. 6	95.5	82.0	62.0	41.5
Aug. 30	96.5	91.5	64.0	44.5
Aug. 23	96.0	90.5	63.5	43.5
Aug. 16	95.5	90.0	63.5	41.5
Aug. 9	96.0	90.5	62.0	40.0
Aug. 2	97.5	90.5	60.0	40.0
July 26	96.0	89.5	60.0	37.0
July 19	95.0	88.0	56.5	36.0
July 12	95.0	88.0	50.5	32.0
July 5	92.0	75.0	42.0	24.0
June 28	99.5	89.0	54.0	28.0
June 21	99.0	88.0	54.5	28.0

Freight Car Loadings

(1000 Cars)

Week ended	1941	1940	1939	1938
Oct. 11	904	812	845	727
Oct. 4	918	806	835	703
Sept. 27	920	822	835	698
Sept. 20	908	813	815	676
Sept. 13	914	804	806	660
Sept. 6	798	695	667	569
Aug. 30	912	769	722	648
Aug. 23	900	761	689	621
Aug. 16	890	743	674	598
Aug. 9	879	727	665	590
Aug. 2	883	718	661	584
July 26	897	718	660	589
July 19	899	730	656	581
July 12	876	740	674	602
July 5	740	636	559	501
June 28	909	752	666	589
June 21	886	728	643	559





Auto Production

(1000 Units)

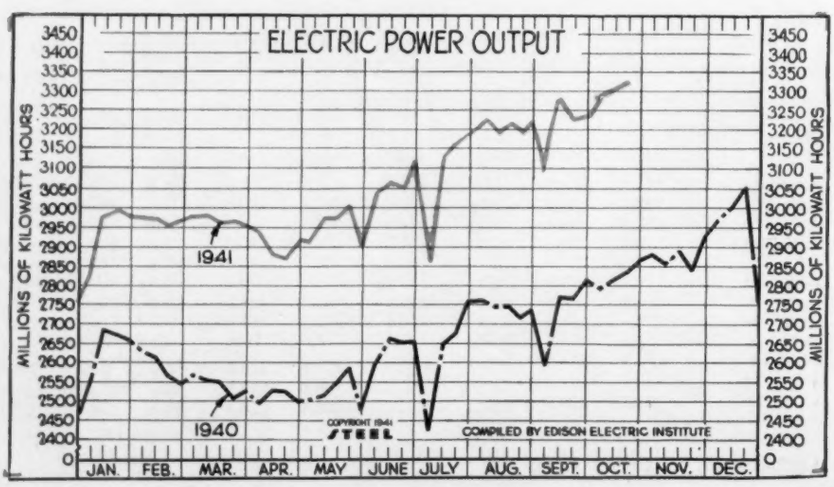
Week ended	1941	1940	1939	1938
Oct. 11	79.1	108.0	75.9	50.5
Oct. 4	76.8	105.2	76.1	37.7
Sept. 27	78.5	96.0	62.8	25.4
Sept. 20	60.6	78.8	54.0	20.4
Sept. 13	53.2	66.6	41.2	16.1
Sept. 6	32.9	39.7	26.9	17.5
Aug. 30	40.0	27.6	25.2	22.2
Aug. 23	45.5	23.7	17.5	18.7
Aug. 16	45.6	20.5	13.0	23.9
Aug. 9	41.8	12.6	24.9	13.3
Aug. 2	62.1	17.4	28.3	14.8
July 26	105.6	34.8	40.6	30.4
July 19	109.9	53.0	47.4	32.1
July 12	114.3	65.2	61.6	42.0
July 5	96.5	52.0	42.8	25.4
June 28	127.9	87.6	70.7	40.9
June 21	133.6	90.1	81.1	40.9

Electric Power Output †

(Million KWH)

Week ended	1941	1940	1939	1938
Oct. 11	3,315	2,817	2,584	2,251
Oct. 4	3,290	2,792	2,554	2,229
Sept. 27	3,233	2,816	2,559	2,208
Sept. 20	3,232	2,769	2,538	2,211
Sept. 13	3,281	2,773	2,532	2,279
Sept. 6	3,096	2,592	2,376	2,110
Aug. 30	3,224	2,736	2,442	2,217
Aug. 23	2,193	2,714	2,434	2,202
Aug. 16	3,201	2,746	2,454	2,207
Aug. 9	3,196	2,743	2,414	2,198
Aug. 2	3,226	2,762	2,400	2,194
July 26	3,184	2,761	2,427	2,160
July 19	3,163	2,681	2,295	2,085

†New series: Includes additional governmental and power generation not previously reported.


ELECTRIC POWER OUTPUT
MILLIONS OF KILOWATT HOURS
1941
1940
COPYRIGHT 1941 STEEL
COMPILED BY EDISON ELECTRIC INSTITUTE
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.

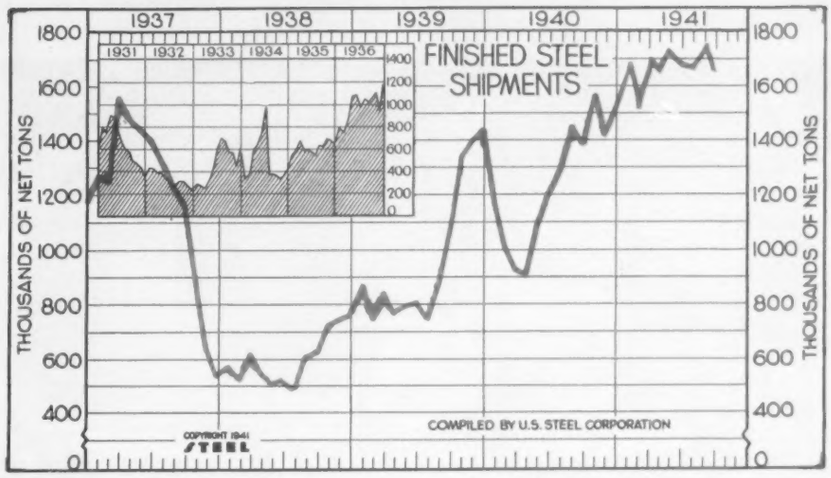
Finished Steel Shipments

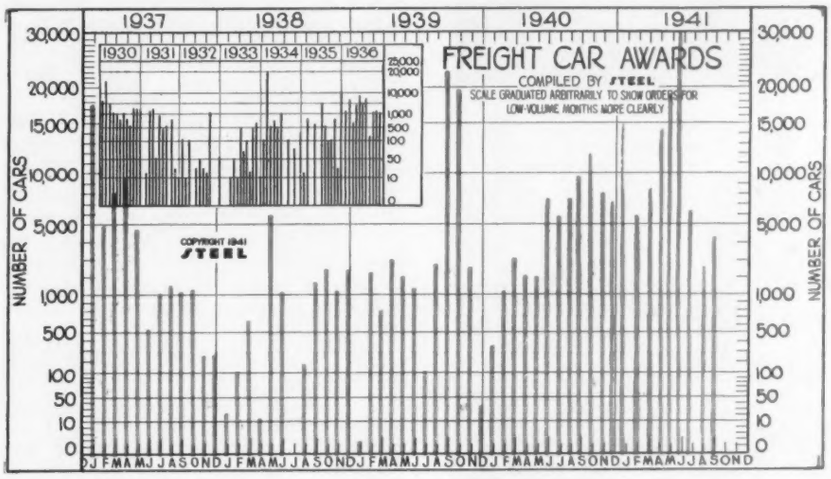
U. S. Steel Corp.

(Unit 1000 Net Tons)

	1941	1940	1939	1938	1937
Jan....	1682.5	1145.6	870.9	570.3	1268.4
Feb....	1548.5	1009.3	747.4	522.4	1252.8
Mar...	1720.4	931.9	845.1	627.0	1563.1
Apr....	1687.7	907.9	771.8	550.5	1485.2
May ..	1745.3	1084.1	795.7	509.8	1443.5
June ..	1668.6	1209.7	807.6	525.0	1405.1
July...	1666.7	1296.9	745.4	484.6	1315.3
Aug...	1753.7	1455.6	885.6	615.5	1225.9
Sept...	1664.2	1392.8	1086.7	635.6	1161.1
Oct....	.....	1572.4	1345.9	730.3	876.0
Nov....	.....	1425.4	1406.2	749.3	648.7
Dec....	.....	1544.6	1444.0	765.9	539.5
Tot.†.	.....	14976.1	11707.3	7315.5	14097.7

†After year-end adjustments.





Freight Car Awards

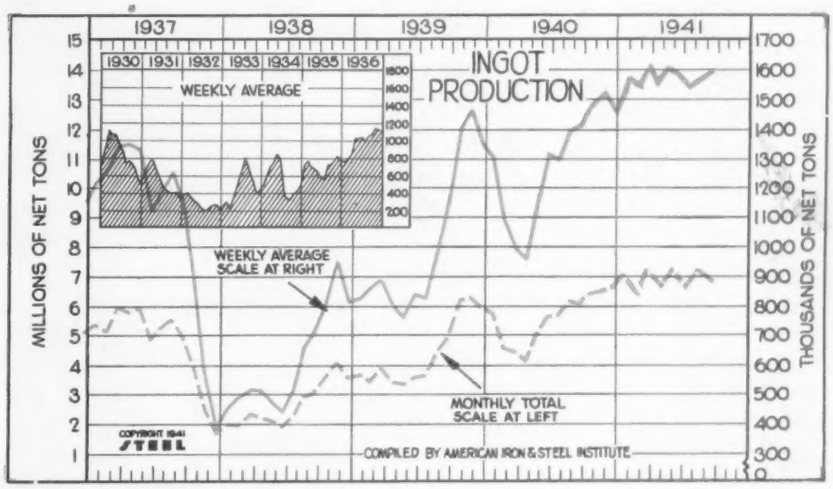
	1941	1940	1939	1938
Jan.	15,169	360	3	25
Feb.	5,508	1,147	2,259	109
March ...	8,074	3,104	800	680
April	14,645	2,077	3,095	15
May	18,630	2,010	2,051	6,014
June	32,749	7,475	1,324	1,178
July	6,459	5,846	110	0
Aug.	2,668	7,525	2,814	182
Sept.	4,470	9,735	23,000	1,750
9 mos....	108,372	39,279	35,456	10,053
Oct.	.....	12,195	19,634	2,537
Nov.	.....	8,234	2,650	1,232
Dec.	.....	7,181	35	2,581
Total ...	.....	66,889	57,775	16,303

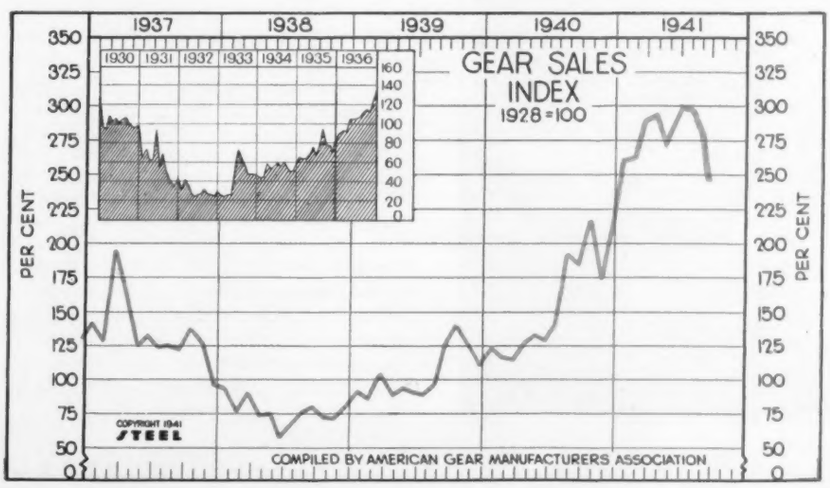
Steel Ingot Production

(Unit 100 Net Tons)

	Monthly Total		Weekly Average	
	1941	1940	1941	1940
Jan.	6,928.8	5,764.7	1,563.9	1,301.3
Feb.	6,237.9	4,525.8	1,559.5	1,093.2
Mar.	7,131.6	4,389.2	1,609.9	990.8
Apr.	6,756.9	4,100.5	1,575.0	955.8
May	7,053.2	4,967.8	1,592.2	1,121.4
June	6,800.7	5,657.4	1,585.3	1,318.8
July	6,821.7	5,724.6	1,543.4	1,295.2
Aug.	7,001.0	6,186.4	1,580.4	1,396.5
Sept.	6,819.7	6,056.2	1,593.4	1,415.0
Oct.	.....	6,644.5	.....	1,499.9
Nov.	.....	6,469.1	.....	1,507.9
Dec.	.....	6,495.4	.....	1,469.5
Total	.....	66,981.7	.....	1,281.2†

†Weekly average.



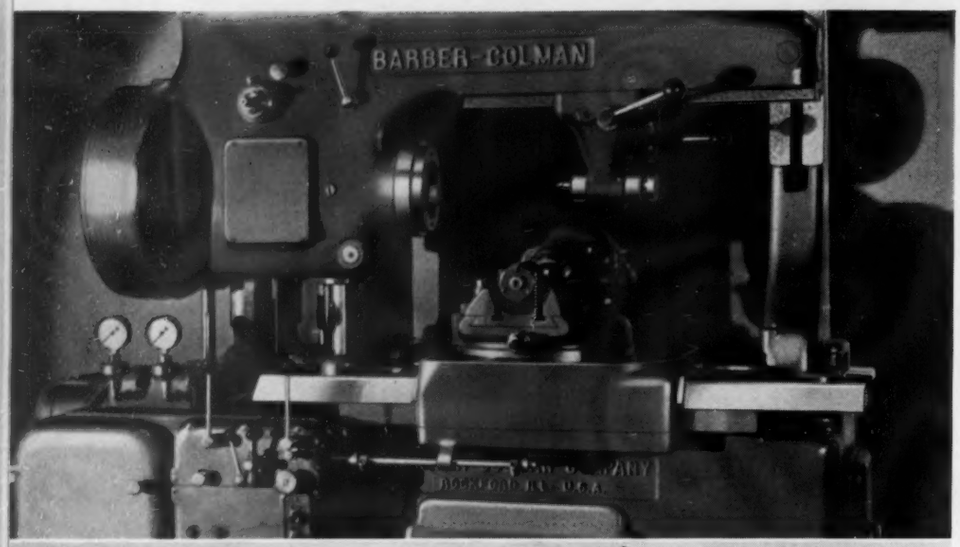


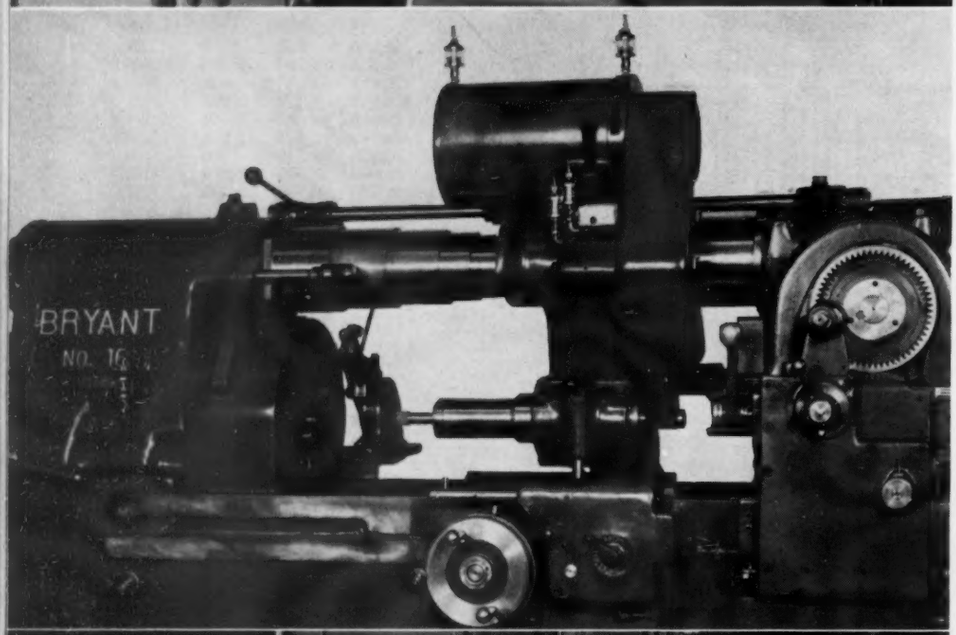
Gear Sales Index

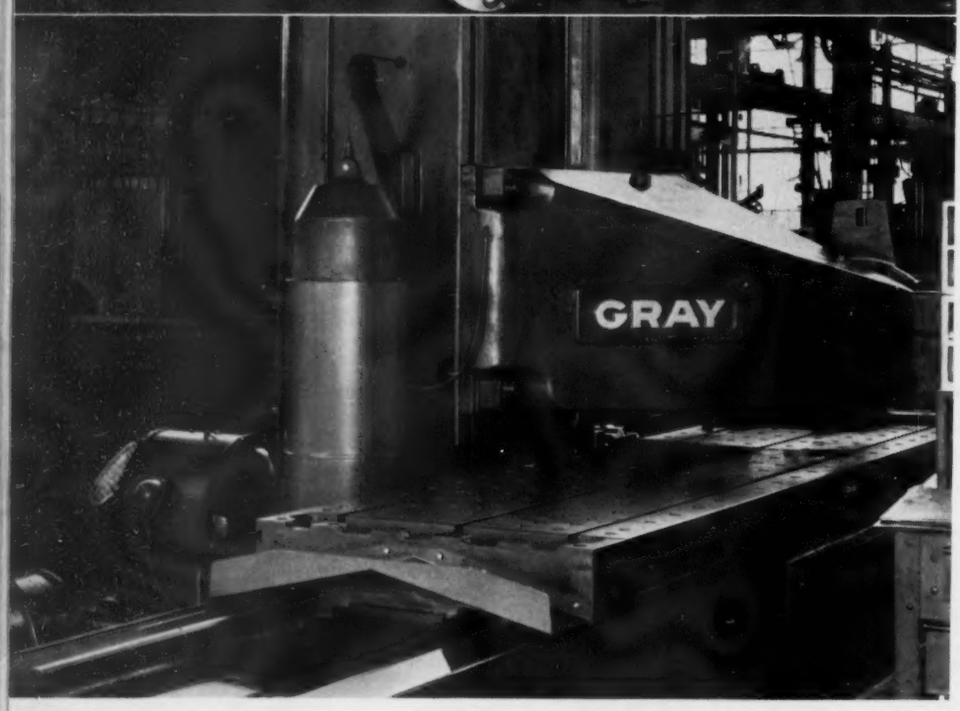
(1928 = 100)

	1941	1940	1939	1938	1937
Jan.	259	123	91.0	93.0	144.0
Feb.	262	116	86.0	77.0	130.5
Mar.	288	114	104.0	91.0	195.0
April	292	128	88.0	74.0	164.0
May	273	133	93.0	70.0	125.5
June	299	129	90.0	58.0	134.0
July	298	141	89.0	67.0	124.0
Aug.	276	191	96.0	76.5	125.0
Sept.	243	183	126.0	80.5	123.0
Oct.	...	216	141.0	72.5	139.5
Nov.	...	173	126.0	72.0	127.5
Dec.	...	208	111.0	81.0	97.0
Ave.	...	155.0	103.0	76.0	135.5

"Workmen







■ WHEN a machine tool is built some of the most expensive and exacting work involved is that of finishing and aligning ways, slides and other guiding surfaces upon which its accuracy depends. The technique of finishing and aligning these ways and their mating slides, involving as it does painstaking hand scraping and the finest kind of precision surface grinding, has no counterpart in any other kind of commercial machinery building. It can be only compared to the making of the precision surface plates which are used in checking the vital machine tool surfaces during the process of finishing them.

One of the greatest problems in machine tool design always has been to protect these beautifully finished surfaces from the wear and tear of production machine shop service. By their very nature, these surfaces—when located for utmost mechanical and structural efficiency—are apt to come in exactly the wrong places as far as their protection is concerned. An example of this is the location of the most vital section of the ways of a lathe or turret lathe directly below the spindle nose, exposed to a constant shower of chips and all too frequent dropping of a heavy chuck or work. That loca-

Fig. 1. (Top view)—Because nothing interferes with their projection over the ends of the bed on this Barber-Colman hobbing machine, effective way-protection is insured by one-piece inverted metal troughs bolted to the ends of the hob slide

Fig. 2. (Center view)—Telescoping in the liberal sense of that term, nesting sets of tubes are employed by Bryant Chucking Grinder Co. to protect the precision bar which supports and traverses the grinding head. At right of head, guard is shown telescoped, at left, extended

Fig. 3. (Bottom view)—To keep chips and scale from being brushed right into the "vitals" of this G. A. Gray variable voltage drive openside planer, a simple sheet steel catch trough is bolted to each end of the platen. This simple but effective way protector should be applicable to numerous types of machines not already adequately protected

n Spare those Ways!"

By Guy Hubbard

Machine Tool Editor, STEEL

tion can hardly be avoided in a well designed horizontal type machine, and while designers have done their best to afford protection and wear-resistance, a certain degree of "wear-damage" hazard is bound to exist.

That is true especially in times like the present when machine tools must be pushed to the limit 24 hours a day, seven days a week, by operators who have not been in the business long enough to appreciate that actions such as rapping out a file on the Vees of a lathe by no means is good for a 35-cent file and is definitely bad for a $3500 lathe.

Recently I was being taken through a shop by a keen-eyed superintendent, when he caught sight of that kind of a file cleaning operation just as it was going on. Upon being jumped on for doing it, the machine operator retorted, "It's just an old file and this is an old lathe!"

Important Point Overlooked

"Young man," the superintendent snapped back, "when I catch a fellow beating a horse, it doesn't make things any better when he tells me that he is only using an old whip on an old horse. I won't stand for any abuse of any lathe or any horse. Remember that!"

"We have a training course for machine tool operators," the superintendent remarked as we continued on our way, "but apparently a mighty important point has been overlooked. As I come to think about it my daughter had a course in musical appreciation in school. What these fellows need is a course in machine tool appreciation and I'm going to give it to them—right from the shoulder. They are going to get a set of 'Don'ts' from me that will put a stop to abuse of machine tools in this shop, and a lecture on the protection and care of slides which will add a lot to the life of our equipment. The machine tool builders have gone to a lot of trouble to put accuracy into these fine machines. It's up to us to preserve it."

His was one of the briefest yet most forceful machine tool lectures in the interest of the national defense production program that I have heard in many a day. Realization of its importance grows on me every time I observe machine tools being abused, and—frankly—I do see altogether too much of that kind of thing these days. If this idea of a practical, straight-from-the-shoulder lecture on machine tool appreciation does catch on in defense plants throughout the country, I know that will help tremendously to remove a serious menace.

Machine tool builders have indeed gone to a lot of trouble not only to build accuracy into their machines, but also to keep it there. One of the most frequent remarks by "non-machine tool men"—upon being conducted through a machine tool plant is—"Why don't they do away with a lot of this hand scraping if they really want to speed up their output?"

The answer to that is, "They already have done away with all hand scraping except that which is absolutely necessary to the accurate alignment and *continued accuracy* of machine tools." That still being done must be done to enable machine tools to do—and keep on doing—the kind of work which today is demanded of them. To do that kind of work, they must be more accurate than the work which they in turn will be called upon to do.

With limits to tenths of thousandths now common on run-of-mine production work, the need for the gage-like precision which is built into modern machine tools becomes quite obvious—and so does the necessity for its careful preservation. Never in the history of this country "did so much depend upon so little." Upon a few ounces of metal on the surfaces of their slides

(*Please turn to Page* 93)

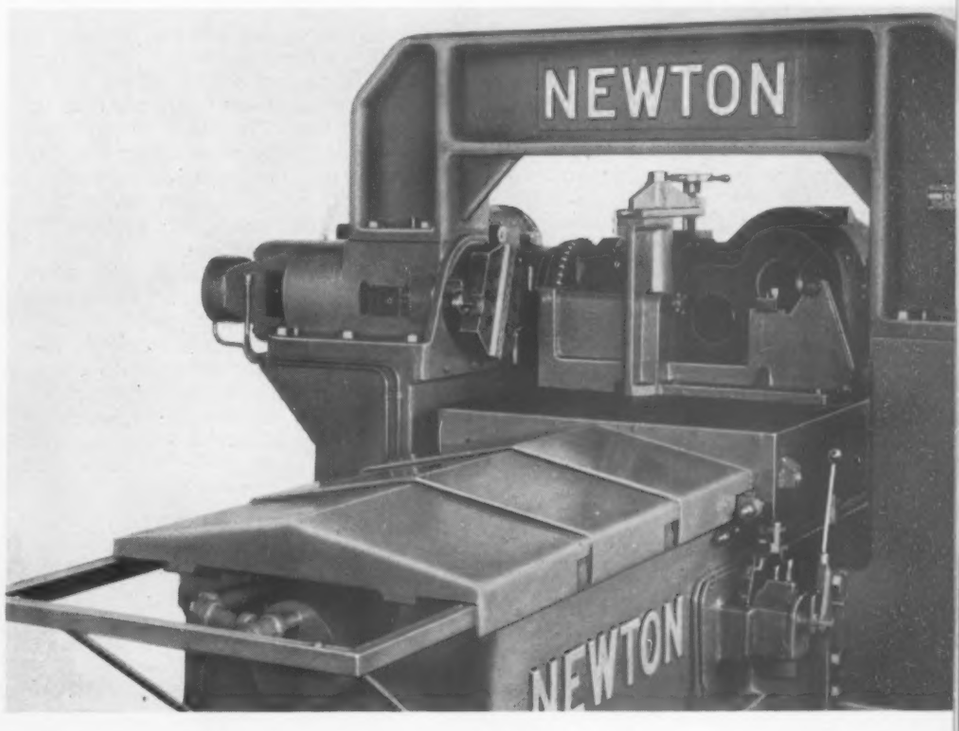


Fig. 4—"Sliding roof" covers are utilized to protect bed ways at both ends of this Consolidated Machine Tool Corp. machine which mills the work during slow traverse of bed, then finish shaves it during quick return stroke

The JOHNSON semi-automatic RIFLE

. . . . its method of operation, how its design overcomes certain difficulties, how it meets requirements of the Ordnance Department, simplicity of manufacturing facilities needed, description of the bolt action and how premature ignition is prevented, analysis of bolt action by "spark" photography

This Is Number 34 In a Series on Ordnance and Its Production, Prepared for STEEL *by Professor Macconochie*

■ THE USE of the mace as a symbol of authority is traditionally derived from the employment of the club as a means of enforcing obedience or imposing the will of the strong upon the weak. Survivals of this custom, such as the policeman's truncheon or the Irish shillalah, are intended for use on the better protected parts of the human body with the intention less perhaps of killing than of producing temporary disablement. In war, however, piercing devices such as the arrow, the sword or the rifle bullet have proved much more effective than the club. Thus modern close-action weapons available for arming the individual soldier include the bayonet and the pistol. As the range of the enemy increases, the hand grenade, the submachine gun, the semi-automatic rifle, the automatic or machine rifle, the light machine gun and the light mortar are employed.

In an article in the June, 1939, issue of the *Marine Corps Gazette*, the well-known inventor of the rifle which bears his name, Capt. Melvin M. Johnson Jr., defines the objectives to be borne in mind while selecting arms for the infantryman —namely "to place in the hands of the individual the maximum power or force which can easily be operated, controlled and transported by one man on his two feet". Thus the basic advance since the days of the flint-tipped arrow has been in the direction of increased power and rapidity of the successive strokes. Maximum power or force in its reference to the fire-arm involves the use of powerful, versatile, one-man weapons, having high potential rate of sustained, deliverable fire of the highest attainable accuracy and maximum range. The matter of transportation limits the weights of the rifle to no more than nine or ten pounds if it is to be comfortably handled, and ammunition to be carried cannot weigh much more than 20 pounds if a reasonable rate and radius of movement are to be maintained.

While these are the primary considerations, there are other important factors which affect the provision and maintenance of these weapons. The state of war being periodic, and considering the happy human faculty of remembering mostly pleasant experiences, the intervening years of respite from strife are commonly employed to beat the sword into the ploughshare and to disregard the plain and always present necessity of preparing for the next conflict. Hence weapons must be capable of rapid manufacture with maximum utilization of equipment already available if disaster from lack of preparedness is to be avoided. Rifles especially are needed quickly in hundreds of thousands if the morale of a large and growing army is not to suffer from a sense of inadequacy.

Add to these problems the extreme necessity of mechanical reliability in the face of intense heat, high pressure, the possibility of lack of skill on the part of the operator, sand, mud, lack of lubrication, conjointly with the necessity of complete interchangeability of the working parts and you have a series of requirements that demand the highest inventive ability and considerable experience in the metallurgical and manufacturing arts. Thus, not many successful solutions of the problem exist, and among those now in the field, active employment in war alone will establish their eventual title to fame.

As indicated in last week's article dealing with the Garand semi-automatic rifle, there are two principal methods by which an ordinary rifle of the magazine type, such as the famous Springfield, may be transformed into an automatic or semi-automatic piece. One is by using part—a very small part—of the energy of the exploding gases to do the work formerly done by the operator's arm in withdrawing the bolt and reloading; or the barrel may be permitted to recoil through a short distance, thereby providing sufficient power from its kinetic energy to perform all the necessary offices. "Blowback" action alone is not well adapted to high chamber pressure rifles, but it may be used to assist the action of recoil as in the Johnson rifle. In blowback actions, the inertia of the bolt is sufficient to maintain closure of the

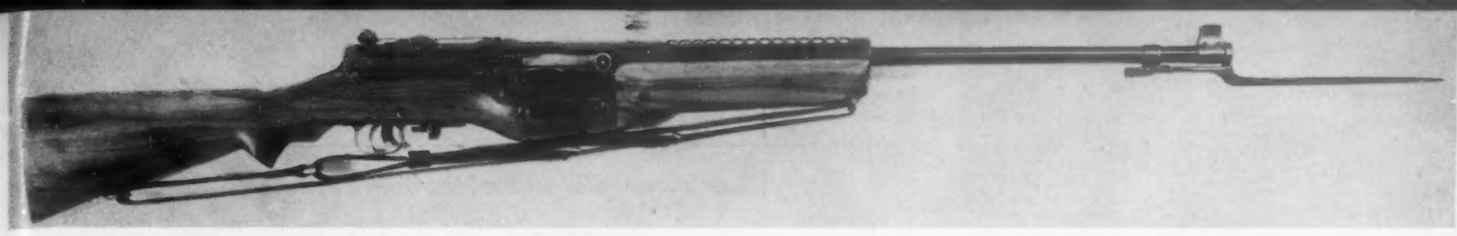


Fig. 1. (Top opposite page)—Johnson semi-automatic military rifle, caliber .30 '06, equipped with sword type bayonet. Weight of rifle, 9½ pounds—bayonet, 0.9 pounds. Holds 10 cartridges in magazine plus one in chamber

Fig. 2. (Directly above)—Johnson rifle as in Fig. 1 but equipped with a light dagger-type bayonet mounted directly on end of barrel. Bayonet in Fig 1 is mounted on forward end of stock, has only guide on end of barrel

By ARTHUR F. MACCONOCHIE
Head, Department of Mechanical Engineering
University of Virginia
University Station, Va.
and
Contributing Editor, STEEL

breech until the barrel pressure has dropped to inconsiderable levels. When used without the assistance of recoil, lubrication of the cartridge is necessary if circumferential fracture of the cartridge case is to be avoided.

Among the objections to use of recoil in a military, semi-automatic rifle is the matter of using a bayonet on such an arm. Two troubles may arise. First, the addition of the mass of the bayonet to the recoiling barrel may slow down the action, to its detriment; and the bayonet —if mounted on the barrel—may cause the bolt to unlock at a crucial moment when the soldier may want to pull the trigger. The answer to this objection is apparent in Fig. 1, which exhibits the Johnson rifle equipped with a sword-type bayonet mounted on the fore stock and receiving only lateral support from the barrel, which is free to slide independently of the bayonet. Another design, Fig. 2, employs a comparatively light dagger-type bayonet mounted conventionally on the barrel. The addition of this extra mass has no important effect, apparently, on the action. With this latter arrangement the bolt *could* become momentarily unlocked during the forward thrust of the bayonet, but the rifle would again be ready to fire on reversal of the thrust during withdrawal.

Other objections to employing the principle of recoil center about the increased length of the receiver; the possibility of increased weight; and the influence of the recoiling barrel on the accuracy of fire. To the first of these there is no answer since the Johnson is 3 inches longer than the Garand, principally on account of the increase in length of the receiver. The weight is approximately 9½ pounds (or about the same as that of the Garand) while the accuracy, as far as can be judged, is comparable with the ordinary bolt action rifle.

Criticism has also been offered of the exposed barrel which might be grasped in the heat of battle with resultant injury to the hand of the operator. If Figs. 3 and 4 be considered, the position of the arm while the operator grasps the rifle in both the prone and upright positions, would appear to render injury from burning well-nigh impossible.

Having raised these questions (which must be in the mind of the

Figs. 3 and 4. (Directly below and opposite page)—As Capt. Melvin M. Johnson, the inventor, shows here, injury to the operator's hand from grasping the heated barrel is difficult, in firing from either the prone or kneeling position

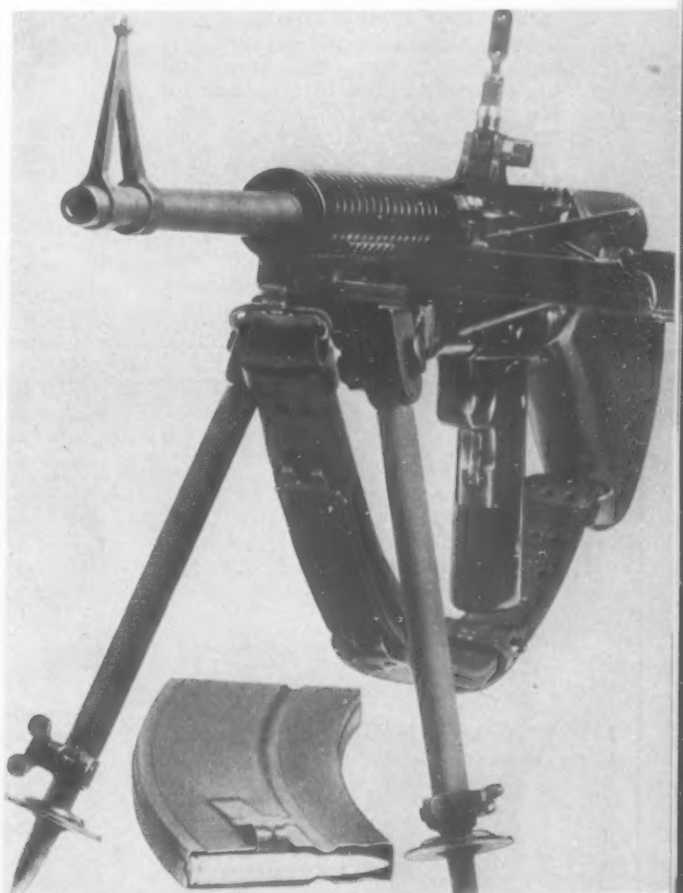


Fig. 5—Upper view, right, the "business end" of the Johnson with magazine removed. Note small frontal area exposed. Fig. 6—Lower view, right, the Johnson with bipod mount and sling strap, cocked with bolt open for full automatic fire. Small switch just above trigger is swung upward to vertical for "safe" and thrown forward for semi-automatic operation. Weight as shown, 14 pounds

Fig. 7—The inventor and the author inspect barrels being made for the Johnson gun

reader who studies the design of this interesting rifle) we may reasonably proceed to point to those criticisms which the use of the recoil principle avoids. For example, fouling of the working parts does not occur, other than the normal effects upon the interior of the barrel. The naked barrel cools more readily than if packed with wood. Indeed it is said to be virtually impossible to heat this barrel in the ordinary course of operation to the point where the action fails. This efficient cooling enables the mechanism to be incorporated in a machine rifle and mounted on a bi-pod for sustained fire, as shown in Figs. 5 and 6. Further, the short recoil rifle lends itself to sturdiness of design and relative simplicity of the component parts.

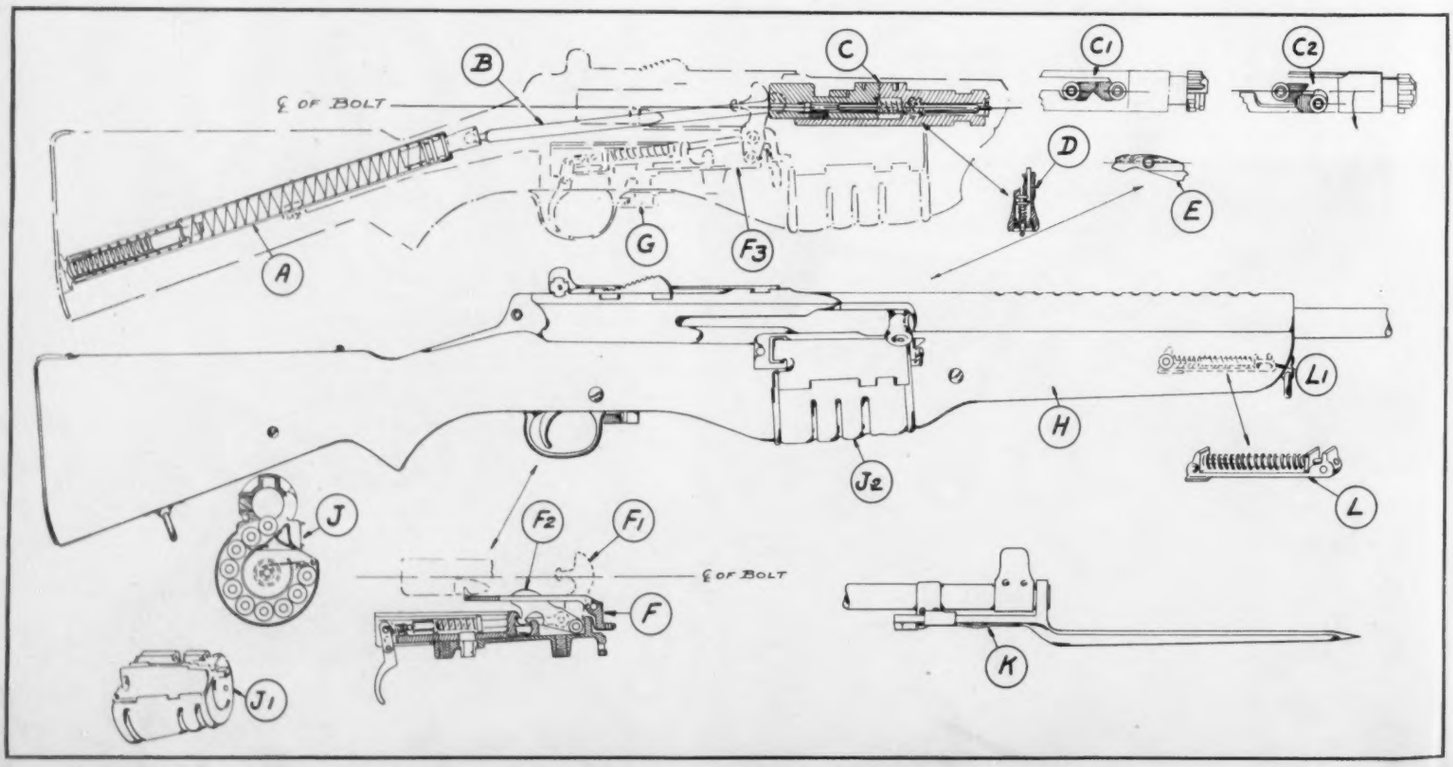
What, perhaps, impressed the writer most while at Johnson Automatics Inc., Providence, R. I., was the simplicity of the manufacturing facilities. Rifling machines are there to be sure, and chambering machines, but the associated plant of the Universal Winding Co., in which much of the work is done, has all the familiar characteristics of an up-to-date machine shop.

Fig. 7 shows the inventor and the author inspecting barrels being made ready for any eventualities in the Netherlands East Indies. Fig. 8 is a new Fay automatic going in. Rifling and barrel boring activities have already been described in STEEL, Oct. 6, 1941, p. 60, and Oct. 13, 1941, p. 110.

The modus operandi of the Johnson rifle may be followed from Fig. 9. Essentially this weapon consists of a .30-caliber barrel which is free to slide for a distance of about 0.375-inch, suitable bearing being provided in the receiver and its forward cylindrical extension. There is a rotary locking bolt as seen in Details C_1 and C_2 consisting of two portions, the rear part sliding within the forward portion. Each of these separate parts carries a cam extension as shown by the vertical and horizontal section-lining of the bolt details. Clearly these separate parts are free to slide and rotate relatively to one another, the rollers being provided to reduce friction between the bolt cams and the receiver slots.

Since the bolt action of this rifle is both highly ingenious and, one might say, the central function of the whole cyclic process, it merits careful study. The head of the bolt has eight circumferential locking lugs disposed on eight of nine equispaced radii, the ninth space accommodating the extractor, as may be observed in Detail C_1. Thus in order to lock the bolt in the abutments in the barrel assembly, a rotation of only 20 degrees is necessary. In locking an ordinary bolt action rifle

Fig. 9—Diagrammatic outline of essential parts of the Johnson. For explanation, see text



More Information on Modern Shell Production

STEEL's first reprint handbook on "Modern Shell Production" detailed the methods and equipment necessary for the most efficient production of high-explosive shell—that is, the shell body which undergoes fragmentation as it reaches its objective. Over 1000 copies of this 76-page book have now been distributed and a limited supply is still available at $1.00 per copy.

Now, a second handbook has been compiled. It goes into further detail on the manufacture of shell, as well as brass cartridge cases, small arms ammunition, shell and bomb fuzes, the flight of the projectile and the airplane bomb. This second handbook is attractively bound, fully-illustrated and entitled "More Information on Modern Shell Production." Orders should be addressed to STEEL, Readers Service Department, Penton building, Cleveland. Price, 50 cents per copy.

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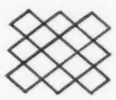

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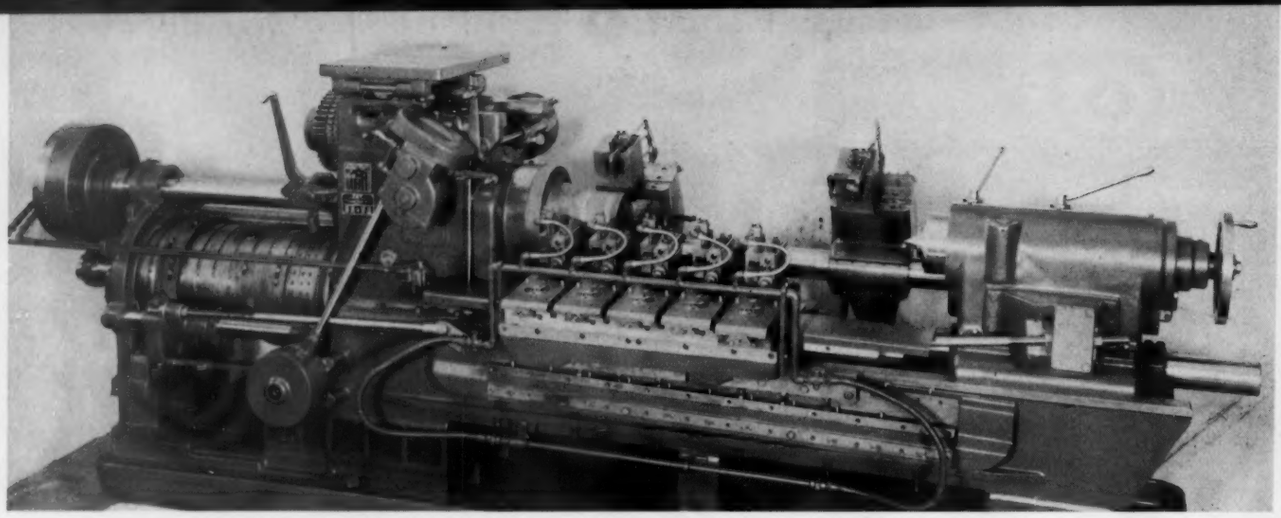

Fig. 8—A new automatic lathe for making Johnson gun barrels arrives at the plant

by hand, the operator pushes forward the bolt and rotates the operating handle. In the Johnson rifle this is carried out by the pressure of the mainspring "A" acting upon the left hand cam (Detail C_1) causing the bolt cam to rotate clockwise to the position shown in Detail C_2 when viewed from the rear. The breech is now closed.

Before proceeding to consider the reversal of this process whereby the bolt is unlocked and the cartridge case extracted, we note that suitable provision is made for the prevention of premature firing of the piece. If Detail C be studied carefully, the firing pin may be seen to possess a collar or "safety head" which bears on an insert or T-pin when driven forward by the hammer F_2. The relationship of the dimensions of the several parts of the bolt assembly is such that the point of the firing pin cannot emerge from the face of the bolt until the two major components are in the position shown at C_2 or, in other words, until the bolt is fully locked.

On discharge, bolt and barrel (still locked together) commence to move backward. However, this action cannot proceed until the cam extension of the bolt is cammed around by the face of the slot in the receiver, against which the cam was pressed by the mainspring during locking as above described. The righthand face of the cam (viewed from the rear) is inclined at an angle of about 38 to 40 degrees—an angle which has been so selected that relative rotation of bolt and barrel is impossible until the bullet has left the muzzle and the gas pressure in the barrel has suffered a sudden drop. See calculations below. At this same instant the forces of recoil rise sharply, the bolt unlocks with great rapidity and residual gas pressure, helped by the "jar" of the retreating barrel against its shoulder stop, aids the inertial force acting on the bolt to withdraw the cartridge case from the chamber and eject it.

This analysis of the bolt action of the Johnson rifle is borne out by spark photographs taken by Prof. Harold E. Egerton at the Massachusetts Institute of Technology, who observed that unlocking commences when the bullet is about two feet from the muzzle and ends when the bullet is some 4 or 5 feet away. On this basis, unlocking takes place in an interval of the order of slightly over 0.001-second. But there are one or two other aspects of the matter which might escape the attention of the casual observer. First, the rearward thrust of the barrel necessary to neutralize the forces of acceleration of gas and bullet are partially absorbed by the inertia of the accelerating barrel, together with the bolt. Of course these latter are finally brought to rest but it would appear reasonable to suppose that the shoulder pressure curve is altered favorably. Then the contact of cam and receiver cam slot sharply relieves the pressure (and hence also the friction) between the bolt lugs and the locking abutment in the breech, making unlocking easy.

Following the release of the bolt from the barrel, momentum and a certain residual chamber pressure combine to effect the further rearward progress of the bolt, cocking the hammer (shown in the cocked position at F_2) and compressing the main spring of the rifle, A, Fig. 9. Retracing our steps for a moment to the instant of bolt and barrel separation, as the latter is brought to rest, the extractor claw in engagement with the cartridge cannelure throws the inertial force of the moving bolt in the line of withdrawal, giving the spent cartridge a sharp loosening jerk. Carried backward with the bolt, the cartridge case is finally ejected through the port by the ejector, which passes through a slot in the left side of the bolt, as in the United States rifle model of '03, the Mauser, etc.

The bolt being finally halted in its tracks by the buffer plate set in the rear of the receiver, the return stroke commences under the impulse of the main spring. Meantime the next round has partially emerged from the magazine as shown at J, Fig. 9, and only awaits a push from the bolt to send it home. If the rotary magazine be examined, it will be seen to have a finger, actuated by a central spring, which pushes the cartridges around and into position. With the entry of the bolt-locking lugs into the abutments of the barrel-locking bushings, the cycle is complete and the rifle is once more ready to fire.

(Concluded Next Week)

Manual "Tells All" About Tungsten Carbides

■ In order to assist defense industries, Carboloy Co. Inc., Detroit, has published a manual which, for the first time, includes instructional material covering virtually every conceivable factor connected with the use of tungsten carbide tools. Not only does it cover the design of carbide tools themselves, the selection of tool shapes, tip and shank sizes, relief angles etc., but it also covers such related items as design and setting of tool holders, machine recommendations, tool holder screws, correct methods of using coolants etc.

For manufacturers desirous of producing their own tools, it provides complete instruction on torch brazing technique, materials and equipment.

Also embodied in the manual are complete charts of recommended feeds, speeds, tool angles and depth of cut for various materials—steel, ferrous castings, nonferrous and nonmetallic.

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Factors Affecting Structure and Grain Size of ELECTRODEPOSITED COPPER

■ THERE appear to be nine factors that influence the electrodeposition of copper. These include:

Current density. In general the grain size becomes smaller with the increase of current density.

Temperature. The grain size becomes smaller with decrease of temperature.

Acidity or pH. The effect has not been definitely established as conflicting statements appear.

Concentration of the metal ion. The grain size becomes smaller with decreasing concentration.

Cathode potential. The grain size becomes smaller with increase of cathode polarization; that is, as the cathode potential becomes less noble.

Agitation or stirring. In general, the grain size becomes smaller with increased stirring.

Addition agents. The grain size may be made markedly smaller by addition of certain substances, especially colloids.

Presence of other ions. The grain size becomes smaller when other ions are present, especially through use of a complex ion of the metal deposited.

Condition of the surface of the basis metal. The grain structure of the deposit tends to follow grain structure of the basis metal.

Of these variables, four were chosen for study—namely, current density, temperature, acidity and cathode potential. The concentration of copper was kept constant. The bath was stirred at a nearly constant rate for all experiments and no addition agents or other ions were used. The effect of the surface of the basis metal was eliminated by a special method to be described.

Determination of Grain Size: To quantitatively compare the grain size, metallographists usually compare the sample under observation with a series of standard photomicrographs, using laboratory exponential numbers; or they express it in grains per square millimeter or give the mean diameter of grains. The latter method is not much use in ferrous metallography but is commonly employed to indicate the grain size of copper and brass.

Also, since the grain size affects directly several properties of metals, the possibility of adopting an indirect method was considered. Hardness, rate of chemical solution, electrical conductivity, thermal coefficient of electrical resistance, optional examination, electron diffraction, and X-ray examination were considered, but final method adopted consisted of counting the grains intersecting a diameter on the ground glass of a microscope where the image of the specimen is projected to a suitable magnification and then referred to 1 millimeter of the surface. The average of five or six counts was taken as the grain size which corresponds to the number of grains in one millimeter. Small numbers denote large grain size, while large numbers denote smaller grain size. This has been called the "intercept" method.

The specimens were etched with a solution of one part nitric acid to four parts of water, after the surface had been polished by grinding on emery paper and by rubbing with an acid solution of potassium bichromate.

The Cathode Surface: Influence of the basis metal on the crystalline structure of the deposit has long been considered of importance. There are indications that the preparation of the cathode surface may determine the shape of the crystal of the deposited metal and its grain size. Yet this point has sometimes been neglected.

The influence of the basis metal depends especially on the crystalline structure because of the tendency of the deposit toward the reproduction of the crystalline structure of its support. It depends also upon the chemical nature and condition of the surface, which will affect the contact with the electrolyte, the hydrogen over voltage, or allow some possible chemical reaction to take place.

Different methods have been devised to prevent the crystalline continuity of the electrodeposits. A thin layer of hydrophilic colloids (proteins and peptones) is quite effective in the case of copper except when the support consists of electrolytic copper.

Also the cathode may be polished with progressively finer emery, cut down, buffed, and finally color buffed to a high luster to insure freedom from scratches, pits, etc. This may produce a difference between the deposit near the support and subsequent layers, due to the fact that the conditions of electrodeposition on the surface of the support are not the same as when deposition is on the metal already deposited.

Other investigators have found that any important variation in current density leads to a correspondingly clear demarcation in the deposit, even without interrupting the current. Sometimes to interrupt the crystalline continuity at the junction, an electrolytic layer of fine crystalline nickel or chromium has been used.

To be sure that the basis metal would not affect the deposit in the present work, preliminary experiments indicated that if the copper base was polished to a high luster there would be practically no continuity of the basis metal unless at some point near the pits. However, the deposit is not uniform at the junction with surface, probably because of the irregularity of the buffing material. On the other hand, if the supporting surface is ground with progressively finer

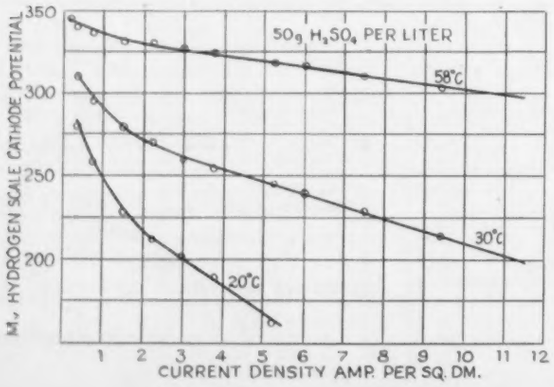
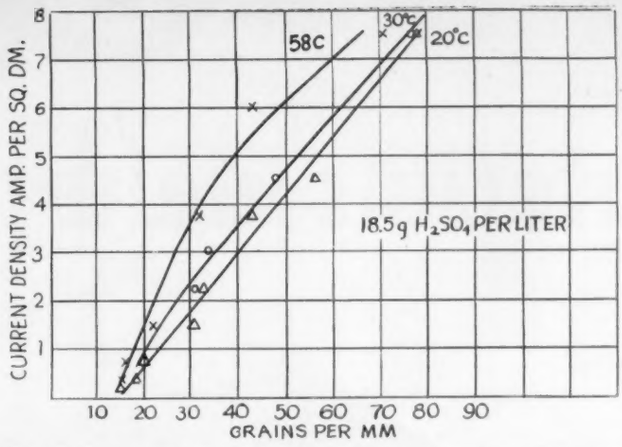


Fig. 1—This series of curves shows how cathode potential varies with current density for different bath temperatures, the acidity remaining constant at 50 grams per liter

From a paper by Allison Butts and Vittorio De Nora, Lehigh university, Bethlehem, Pa., presented at the 79th general meeting of the Electrochemical Society, Cleveland, April, 1941.



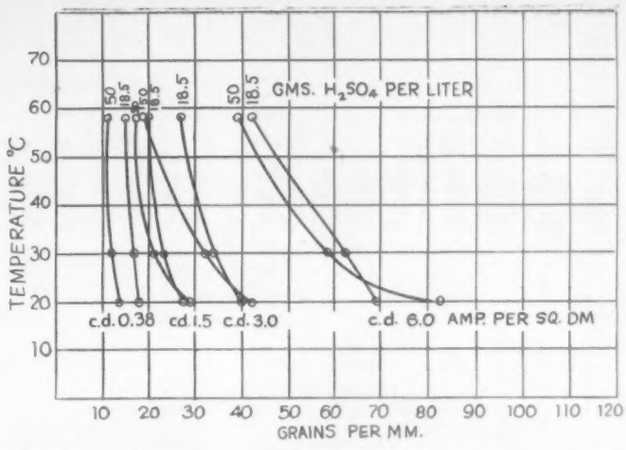


Fig. 2—Left, variation of grain size is plotted against current density at three bath temperatures, acidity constant. Fig. 3—Curves at right show effect of temperature on grain size for various values of acidity and current density, which are constant for each curve

emery paper and then rubbed with solution of potassium bichromate, the continuity of the grain through the junction will be perfect as shown by micrographs taken through cross sections. In other words, this latter method will produce perfect continuity of the grain structure.

It was found that if at the beginning of deposition the current is interrupted three or four times, the cathode taken out of the bath, washed with N H_2SO_4 and distilled water, and the electrolysis started again, there is no continuity of grain whatever, the deposit being uniform from there on.

This latter method, accordingly, was the one used in all experiments. The surface first was prepared by grinding with fine emery paper before rubbing on a little oil. This was found to make it easier to strip off the cathodes for X-ray examination.

Results: The influence of the various factors upon the structure of the deposit of course was much interrelated so no one factor could be considered separately. The effect of some factors may be reversed by change in the values of the other factors.

The rate of variation of the cathode potential with the current density is different at different temperatures and acidities. Fig. 1 shows the variation of the cathode potential as a function of the current density. Each curve is at a constant temperature, acidity and metal ion concentration. At high temperatures, 58 degrees Cent., the value of the cathode potential is more positive (more noble than at low temperatures, and gradient with current density is also smaller. This was true over the whole range of acidity. The gradient of these curves always increases with the content of acid and decreases with temperature. This may explain why other investigators have stated that polarization increases as pH decreases and other investigators have found just the opposite.

Effect of Current Density: As shown in Fig. 2, at low current density the deposit is coarse grained because the crystal grains are larger in the case of slow deposition than in the case of rapid deposition. By increasing the current density, the deposit becomes finer; but with further increase the crystal grains are no longer regular, a broken structure being obtained, and the surface is nodular. A broken structure masks the true grain size and contributes to nonuniformity in the grain.

At extremely low current densities, the rate of discharge of ions is small so the rate of crystal growth may easily keep pace with the rate of liberation of metal atoms. Under such conditions it probably is easier for the crystals to grow than for fresh nuclei to be formed, and so the deposits are coarsely crystalline.

At higher current densities, however, the rate of crystal growth may not be sufficient to cope with the atoms liberated and so fresh nuclei will be formed and a fine-grained or even spongy deposit obtained. Increase of current density thus causes the size of crystals to diminish by increasing the rate of nuclei formation.

Fig. 2 also shows that the variation of grain size with current density is greater at low temperatures than at high temperature for low or medium acidities. At higher acidities, this may not hold.

Twin Crystals: In examining deposits obtained under conditions which produce high internal stress, numerous twin crystals were found. At low current densities and high temperatures, no twin crystals were evident. Therefore it is probable that such crystals accompany high stress in electrolytic deposits.

Effect of Temperature: Deposits obtained at high temperatures have larger grains than those produced at low temperatures. Temperature affects the character of the deposit by its effect on diffusion, on reaction velocity, on the relative rates of nucleus formation and crystal growth, and on polarization. Increased temperature also reduces polarization and so tends to make larger crystals. In Fig. 3 grain size is plotted against temperature for different values of acidity and current density which are constant for each curve. Note that at high current densities, rise of temperature is effective in increasing the grain size. The deposits obtained at high temperatures also were more uniform as regards the grain size.

Effect of Acid Content: By increasing the acidity, the conductivity of the solution is increased and therefore there is less tendency for the metal ions to deposit on projecting points. The result is a smoother deposit. Since grain size determinations were combined with two acidities, 18.5 and 50 grams per liter of sulphuric acid, no curves of grain size versus acidity are given. The results of the tests show, however, that acidity up to 50 grams per liter is of less importance than temperature in its effect on grain size. In general grain size was somewhat smaller at 18.5 than 50 grams per liter at low current density. At high current densities, the reverse was found when the temperature was 20 degrees Cent., but at 58 degrees Cent. this reversal did not occur. Thus general conclusions as to the effect of acidity can hardly be drawn from these results.

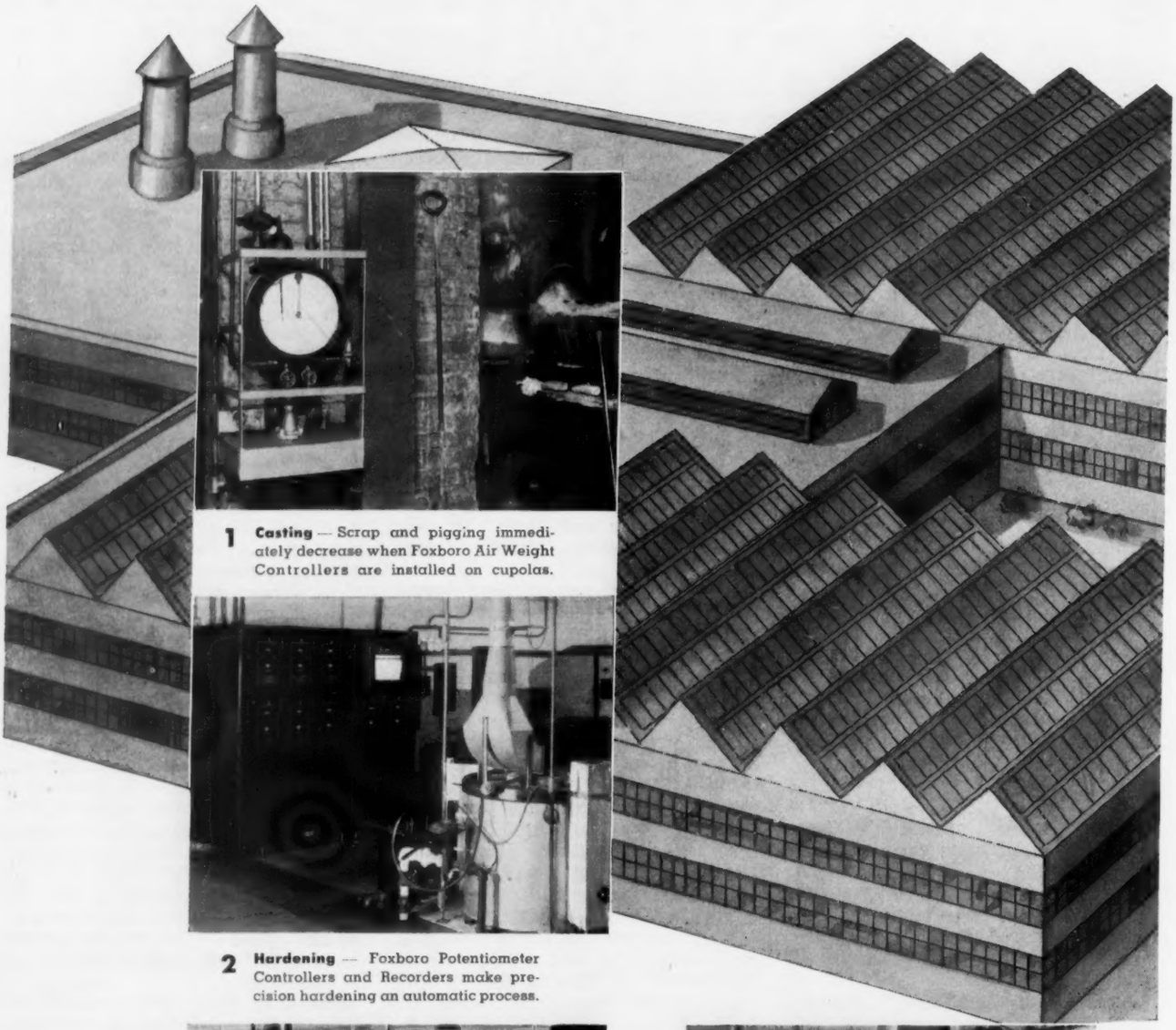
Conclusions of this investigation show that grain size becomes progressively smaller as current density is increased. Also, current density has a greater effect on grain size when the variation of cathode potential as a function of current density is large.

Rise of temperature in the electrolyte was found to increase the grain size of the deposit. Temperature rise may alter the effect of change in acidity.

The effect of acidity depends greatly on the other factors. In general it is small up to 50 grams per liter concentration but may become large at higher acidities. The direction of its effect, too, is different under different conditions.

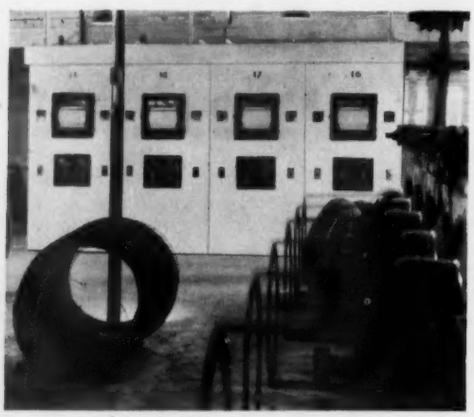
The grain size was found to become smaller as the cathode potential becomes less noble (increases cathode polarization).

Spoilage of Materials Held



1 Casting — Scrap and pigging immediately decrease when Foxboro Air Weight Controllers are installed on cupolas.

2 Hardening — Foxboro Potentiometer Controllers and Recorders make precision hardening an automatic process.



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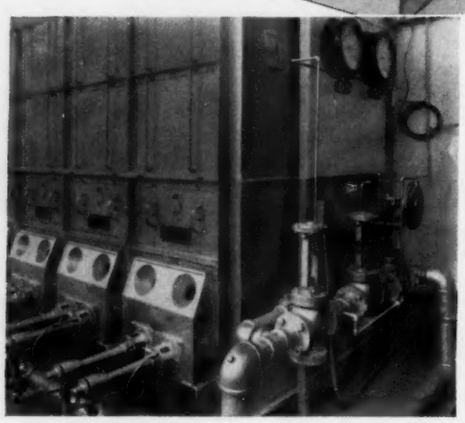

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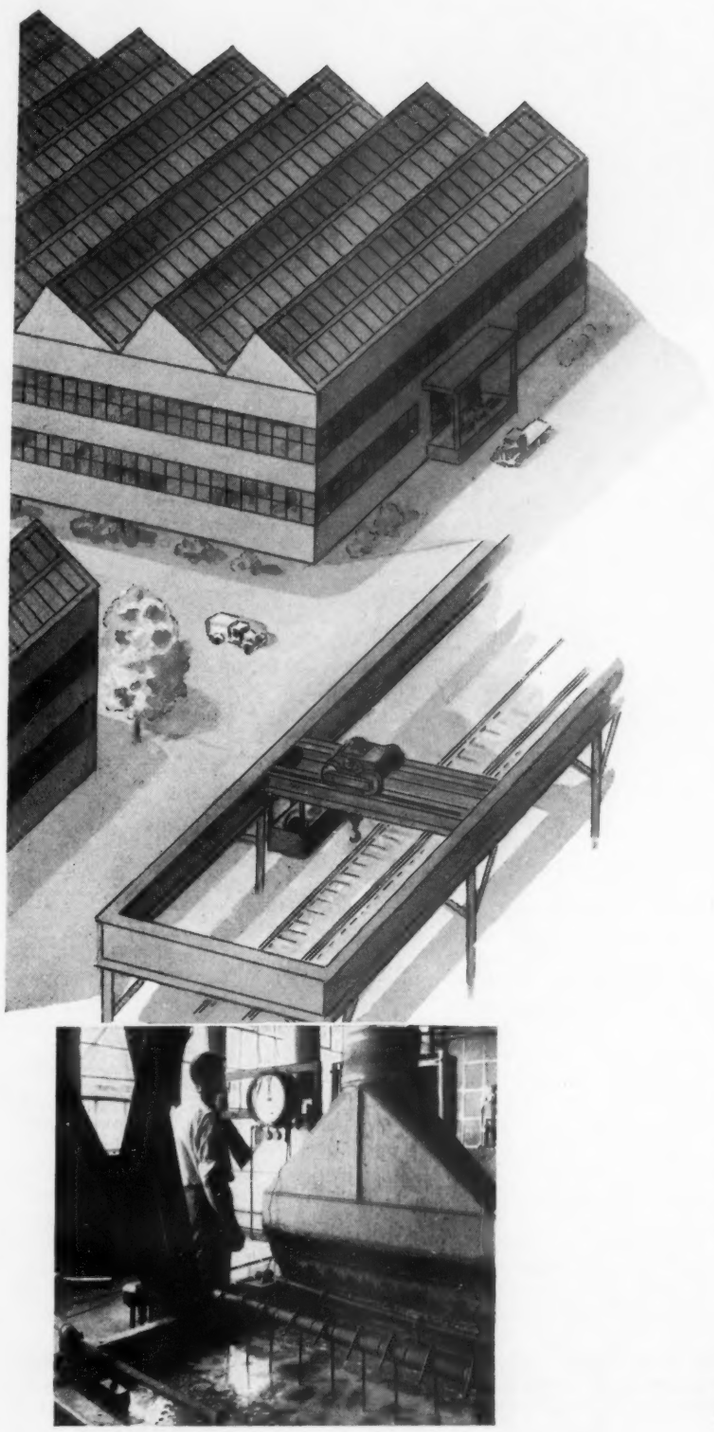

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Fig. 1—Light-weight firebrick sectionally-supported wall. Tile around burner are supported separately

STREAMLINING

with insulation and steel construction

By S. M. JENKINS
Building Materials Division
Armstrong Cork Co. Inc.
New York

■ PROGRESS made by insulating brick and later insulating firebrick is closely tied in with the increased use of steel in firebrick masonry or wall construction. Insulating firebrick as a rule where used are not as strong and the walls are not of the massive firebrick order. The trend with the light-weight insulating firebrick has been towards walls and arches of the highest efficiency.

It has been found in a great many of the old furnaces which used heavy construction that this light-weight design would give better results. At times a wall that would meet all conditions was so thin that mechanical means were required to make it strong enough to be practical. This construction requires various types of steel and steel alloy hangers and supports. Some constructions or sections are even of the removable panel type.

One of the best examples of this trend toward the use of lighter walls and the increased use of steel is brought out by C. A. Frankenhoff*. His figures and conductivities cited in columns 1 and 2 of the accompanying table are brought up to the present day in columns 3 and 4 at the same temperatures and conditions.

Use of steel hangers and supports effected attractive weight reductions in the last two constructions shown. As the lining brick material weight was reduced, the steel weight was reduced and a higher insulating efficiency was reached. Steel besides being used in the hangers and supports is used in buckstays, tie rods, steel shells, bases, and sometimes the covers where the furnace is placed over the wear.

Fig. 2 shows a sectionally supported wall that can be made in practically any length or height. Fig. 3 shows a typical flat arch of the highest efficiency and which is light enough to be made part of a removable roof and/or furnace section.

Light-weight walls are not recommended for replacements of firebrick or massive walls where heat retention is desired; where melting conditions are encountered; where the wall is subjected to direct combustion conditions, such as in the case of coal or oil, or where subjected to high abrasion, etc. In most of this equipment it is found that insulating brick are used in back of the proper refractory or super-refractory. The principal points to keep in mind when designing any type of furnace, boiler, kiln, insulated steel vessels, etc., are the great advantages of these newer light-weight brick and steel supported walls and flat arches.

These advantages are presented with the thought in mind of securing highest efficiencies, sharpness of operations, simplified light-weight constructions and adaptability of the materials for specific purposes.

These features are explained as follows:

1. Low Heat Storage: This storage in walls, bases, and tops or covers of furnaces greatly aids in low fuel consumption, which, naturally, means low fuel cost. This permits more workable heat. Temperature control equipment is aided in sharpness due to practically no backlog of stored heat at furnace temperature changes. This low heat storage means the furnace temperature can be reached and leveled off with little fluctuation.

2. Low Heat Loss: This is a feature of insulating materials in general. Insulating firebrick effectiveness starts at the heat line. There is an actual reflection of heat. All different wall thicknesses are possible by the use of different thicknesses of insulating block between the back of the insulating firebrick and the outer steel shell. In this

*National Petroleum News, October 1928.

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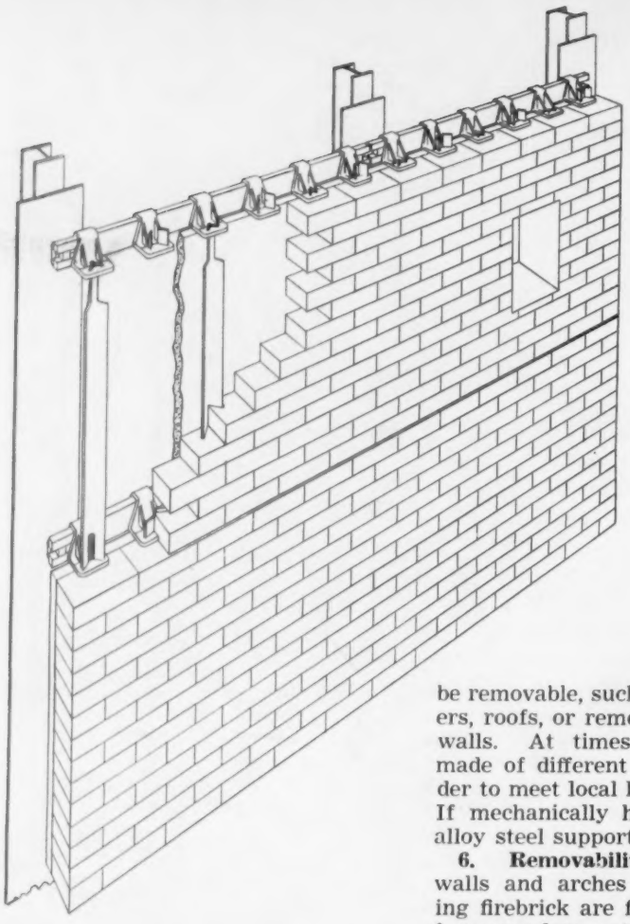


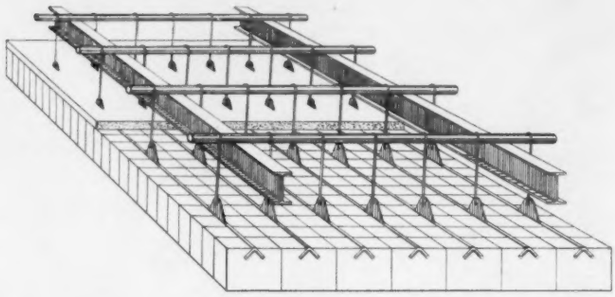


Fig. 2. (Left)—Sectionally-supported wall designed for minimum heat leakage using standard shapes and broken joints for strength

Fig. 3. (Above)—Typical flat arch which affords extreme flexibility and minimum heat loss

space the B.t.u. loss can be made about what is wanted on the outside shell surface.

3. Quick Heating: The intermittent type furnace is especially benefited by lightweight walls due to quick heating. This means as much as several hours saved in starting-up time in the mornings. Where furnaces are operated on a sharp cycle this quick heating or cooling is necessary.

4. Quick Cooling: This is desired where the furnace equipment is repaired over night, on holidays, or weekends, as it allows a mason to start work a few hours after the burners are turned off. It also means little expansion in the walls at the time of repair.

5. Practicability: If a study is made of furnace designs and type of work to be handled it will be found that a thin wall of insulating refractory can be used in a great many cases. Sometimes these can be removable, such as for lift-off covers, roofs, or removable side or end-walls. At times sections can be made of different thicknesses in order to meet local heating conditions. If mechanically held with steel or alloy steel supports these thin walls

6. Removability: Light-weight walls and arches made of insulating firebrick are fine for cover-type furnaces, large stress relieving and refining cracking unit furnaces, and panel-type construction. This light construction is also beneficial for bottoms of cars in car-type furnaces. It is used for lining carbon steel towers in oil processing equipment. There are times when carbon steel towers, vats, rectangular equipment, etc., properly faced with insulating firebrick can be used for high-temperature work instead of expensive alloy steel.

7. Reduced Fluxing: It has been found that low-heat storage in walls built of insulating firebrick has been sufficient to prevent the fluxing of dust or fly ash that comes in contact with it. Tests run were principally in connection with the fly ash and dust encountered on incinerator combustion chamber walls and arches. It also was found that there was no fluxing encountered in the combustion chambers of sewage disposal incinerators and waste-heat boilers.

8. Wider Flat Arch Spans: In large stress relieving furnaces, such as used for stress relieving large welded sections, the charge is generally made through the roof. This light-weight material makes possible removable combined covers and building roof.

9. Practicability: The insulation of large towers and domes is simplified by light-weight, low-expanding linings. Where mechanical methods of holding is used the insulating efficiency of light-weight materials helps protect the hangers. The metal hangers used are generally of alloy steel. Their protection by insulating refractory brick is important. The weights being supported allow the lightest type of hangers to be used. At times pressed steel hangers can be used for the lower temperatures. The low expansion of insulating firebrick materials also aids this type of construction.

10. Machine-Sized: Special shapes and standard shapes, all of light-weight brick and tile, are machined to size which allows a tight fit and permits large shapes to be cemented together on a floor or platform and later placed in the furnace.

11. Simplifies Replacements: In case of breakdown replacements, the blank tile or brick can be used because they can be easily cut or machined on the job. They are handled somewhat similar to blocks of wood by cutting, drilling, grinding, or filing. In an emergency if a large shape is desired several brick or tile can be cemented together. The resulting tile will hold until the required shapes can be secured.

12. Low Inventory: Due to this workability the inventory carried need not be large, as a few large blank tile or standard brick can be made to meet almost any condition. Care should be taken, however, that the material carried in stock will stand high temperatures; this means a high factor of safety when used for any temperature.

13. Better Bonding and Facing: The light-weight porous materials take a bonding and thin facing ce-

VARIOUS TYPES OF WALL CONSTRUCTION

	No. 1	No. 2	No. 3	No. 4
Temperature, °Fahr.[1]	2200	2200	2000	2200
Type settings[2]	13¼" FB 8" RB	9" FB 4½" IB 8" RB	9" FBHW 1" IB	4½" IRHW 1½" IB
Total thickness	21½"	21½"	10"	6"
Materials/sq. ft.	19.5 FB 16.0 RB	13.00 FB 6.55 IB 16.00 RB	13 FB equiv. 1½ bd. ft. IB 14 lbs. castings	6.55 IRB 1½ bd. ft. IB 9 lbs. castings
Weight/sq. ft., lbs.	237	202	109	27
B.t.u./sq. ft./hr. loss.....	777	320	755	425

[1] Temperatures are a little high for best efficiencies but are given for comparisons.
[2] FB, firebrick; RB, red brick; IB, insulating block; HW, hanging walls; FBHW, firebrick hanging walls; IRHW, insulating refractory hanging walls.

ment satisfactorily. When walls become dry and set they become more or less of a monolithic mass. The facing cement seals the joints and the face of the brick into an excellent light-weight wearing surface.

Some of the constructions that are likely to cause trouble if built of insulating firebrick are bafflewalls or bridgewalls where the materials are subjected to heat on both sides. In such cases it is well to allow a factor of safety of 300 to 400 degrees below the burning point of the brick. If possible, a double wall is suggested for such constructions. Where pilasters are used in light-weight walls or flues, at times there has been a pull or strain attributed to expansion of the main wall which is forced to drag these projections along through the insulating firebrick which does not have the tensile strength of firebrick. Such constructions should be watched and avoided if possible. Expansion joints should always be left between insulating firebrick sections joining the insulating firebrick. Because of the low-heat storage in insulating firebrick walls, a furnace cooled by extra air circulation from fans should not be built of such material but a firebrick facing wall should be used with an insulating brick backing. When building sprung arches of insulating firebrick, the key brick should never be driven more than about ¾-inch. This key brick or course should be at least 1 inch wide at the bottom even if a 3-inch brick is required for manufacturing the key. This is to insure a sound key and one of sufficient material or mass to give the greatest strength at the weakest point of the arch.

The laying of insulating firebrick is much the same as the laying of firebrick. The principal difference is that bricklayers should not use their brick hammer in the same manner as when laying firebrick because it ruptures the surface of the porous insulating firebrick material. Insulating firebrick are generally laid by being dipped or rubbed and squeezed into place to insure a thin, tight joint. All dust should be removed from insulating firebrick walls before applying facing cement.

Fig. 1 is a typical light-weight firebrick sectionally supported wall. This is laid in cement and later faced with a facing cement. All expansion joints have been allowed at the proper points. These are filled with an expansion joint material packed in place. The tile around burners are refractory separately supported.

Types Most Suitable

Some of the types of equipment being built in the various industries of insulating refractory walls and some of light-weight hanging furnace walls or panels are as follows:

Steel Plant Furnaces—such as sheet mill, billet heating, galvanizing, tinning, annealing (car-type, box-type, continuous-type, etc); annealing covers, car wheel annealing pits; forging, welding, stress-relieving, heating, tube, and plate heating furnaces, etc.; flue linings, waste-heat boilers, and breechings.

Nonferrous Industry — annealing, brazing, hardening, heating, melting, plate heating, scaling, tinning, and wire processing furnaces.

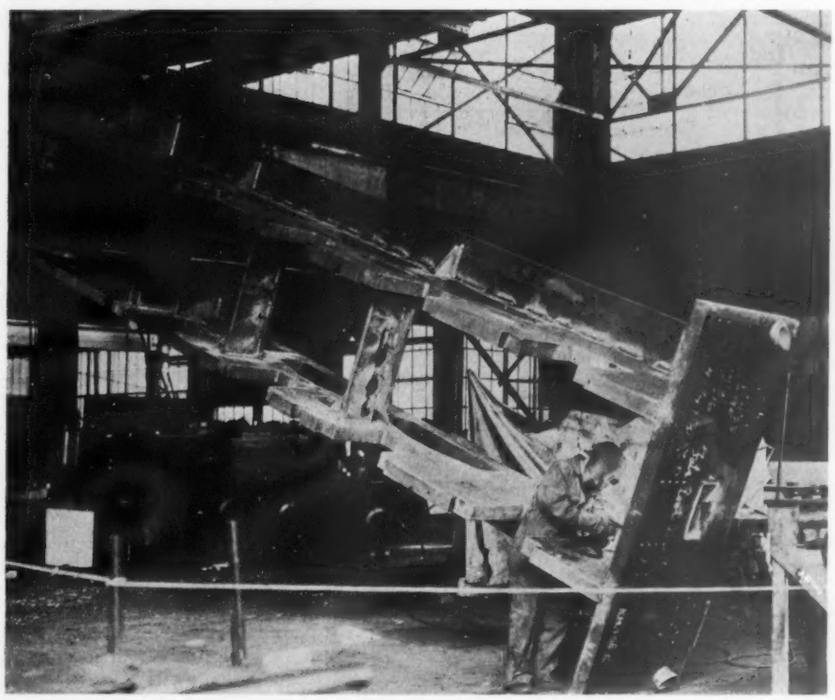
Oil Refineries—cracking unit furnaces for all kinds of processing, waste-heat flues, breechings, boilers, superheater lining, linings for reactors in catalytic work, stack linings.

Glass Industry—glass lehrs, plate annealing furnaces, plate bending furnaces.

Industrial Furnaces—heat treating, tempering, tube heating and bending, tool hardening, and various pot type furnaces; ovens of stationary and conveyor type; core, japanning, baking, and enameling ovens, etc.

When designing a furnace, the streamlining of the steel, brick lining materials, and speeding up of the equipment sufficient to more evenly balance the production cycles is aided immensely by the use of these light-weight walls. These points can be used to advantage, especially by the steel industry, which is decidedly concerned as the manufacturer of the holding equipment making such construction possible.

Welding 6-Inch Plate for Locomotive Frame



■ **Since turning to welded design in 1938, the Fate-Root-Heath Co., Plymouth, O., has welded 300 locomotive frames with no failures in service. Sections run up to 6 inches in thickness with ¼ and ⅜-inch heavily coated Murex electrodes being used. All corner welds and most other welds are positioned for downhand welding. Warping is avoided by back stepping and welding in short stretches at a number of locations throughout the assembly until an overall temperature of about 400 degrees Fahr. is reached. After this, welding proceeds continuously without further allowance. This provides an even distribution of heat and easily permits meeting the aligning tolerance of plus or minus ⅛-inch**

What Steel Industry Offers as a Career

■ *Iron and Steel Industry;* by Ralph H. Watson; paper, 28 pages, 6 x 9 inches; published by Bellman Publishing Co. Inc., 6 Park street, Boston, for 75 cents.

This brochure, by a vice president of the United States Steel Corp., is No. 26 in a series of vocational and professional monographs, each written by a qualified expert.

It gives a birds-eye view of the industry, its classifications and subdivisions; divisions of the personnel; education and training required for various duties; remuneration; chances for advancement; advantages and disadvantages; opportunities for women and other material.

Main purpose of the work is to picture possibilities in the industry for persons planning to seek employment or to train themselves for obtaining employment.

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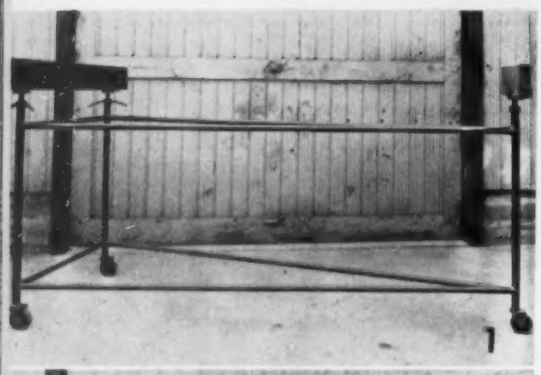
.....speeds construction of aircraft accessories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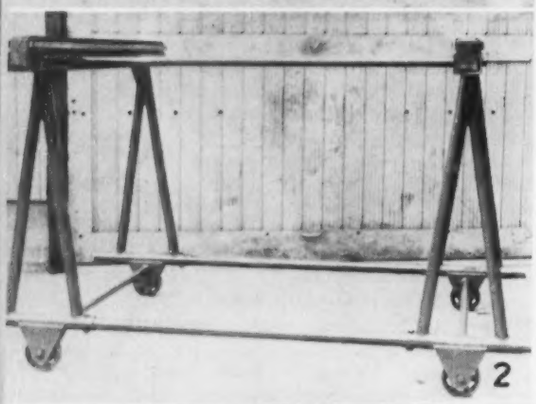
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■ AROUND flying fields and aircraft plants are found a variety of accessory equipment, constructed of steel tubes and generally as neat and trim as an airplane. They also have a deceptive appearance of fragility because aviation engineers are long accustomed to the use of the round tube to obtain strength and rigidity with the least weight, and they do not hesitate to use light sections. A line of accessories that have been fabricated by a tube manufacturer for the Royal Canadian Air Force is indicative of the great variety of requirements that can be met with simple designs.

Standard Tube Co. Ltd., Woodstock, Ont., has made welded steel tubing for many years. One outlet has been through their own fabricating department, where some furniture items as well as mill and factory equipment are manufactured. Thus skilled personnel and machinery were available for making a large number of the things wanted in a hurry when Canada's defense program got under way.

Note Economical Factors

Many original and improved designs have been developed. The examples shown here suggest a wide range of application in other fields. When inspecting these designs, note the factors contributing to economical fabrication. The most common and easily available tube sizes have been used wherever possible. The number of different tube sizes in a single structure is kept at a minimum. The equivalent of SAE 1015 steel is used in preference to special alloys, resulting in easier working and better welding at the joints.

Preparation of joints is by saw cuts wherever possible, because carefully machined fitups are not so essential in structures of this type. These simple designs tend to take full advantage of the inherent high strength-weight ratio of the round tube section and to dispense with such connecting members as are more conventional than useful.

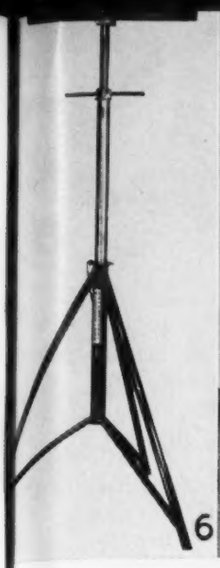
Extremely simple in design is the wing support shown in Fig. 1. The framework is an arc-welded assembly of 1½-inch 16-gage welded steel tube. This is a low-carbon steel of analysis corresponding to SAE 1015, an analysis easily obtainable, with good working and welding qualities. The construction details are obvious. It is a simple matter of welding on the casters and the lifting screws. This support is used for bringing up an airplane wing for attachment to the fuselage.

Carry Heavy Loads Easily

A companion piece to the wing support is the fuselage trestle illustrated in Fig. 2. The principal structural members of this assembly are cut from 2½-inch 14-gage tube. The lower stringers slide through the short tubes on which the wheels are mounted and there is a corresponding adjustment at the top, making the trestle adjustable for length. Although the 14-gage walls are only 0.083-inch thick, they easily carry the load of several thousand pounds.

For inspection and repair purposes the trestle shown in Fig. 6 was designed. The tripod shape was selected for ease in getting a firm footing on uneven ground, the purpose of this trestle being to raise either the nose or the tail of an airplane. The large center column is 1½ inches in diameter 14-gage welded steel tube. The three long legs of the tripod are 1¼-inch 16-gage and the three struts are 1-inch 16-gage. The center column, which gives the principal adjustment for height is 13-gage, and there is a length of threaded solid round which provides a final height adjustment of 8 inches. The first trestle constructed appeared somewhat frail, and a question was raised as to whether it was adequate to support its estimated load of 800 pounds. Under a subsequent test it supported 3000 pounds without evidence of distress.

For general inspection and repair work around the plane, the inspection and repair platform in Fig. 3 was specially designed. The four columns are round tubes, as are the bracing members. The diagonal braces are round tubes attached by bolts to make the entire platform collapsible. The frame of the top is made of rectangular welded steel tubing. The ladder is patterned after a standard design manufactured by the Standard Tube Co. Side pieces have flat



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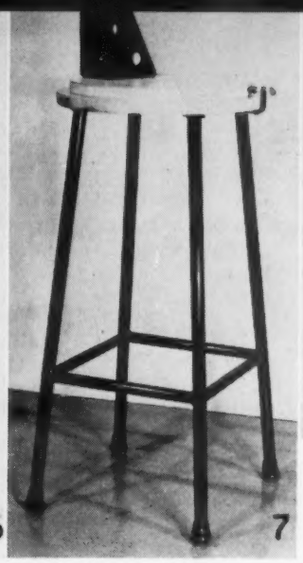

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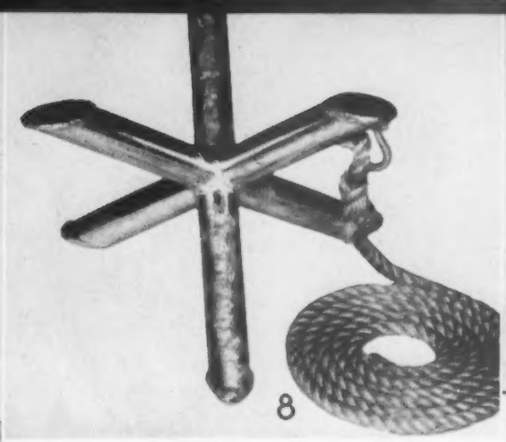

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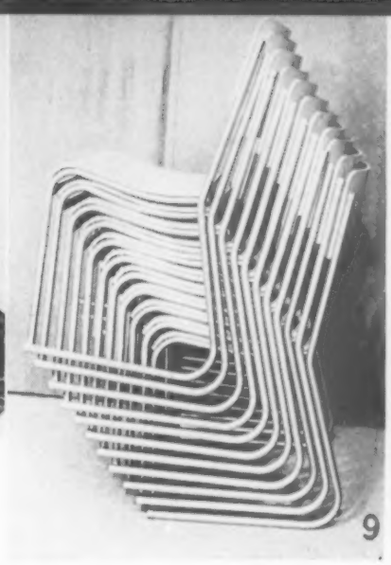

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sides and round edges, obtained by drawing a round tube through dies which form it to this shape in a single pass. The rounds are small-diameter round tubing, welded to both sides of the side pieces to produce maximum rigidity and to exclude moisture from the inside. Note this platform can be moved about like a wheelbarrow by using the lower ends of the ladder as handles. Here maximum advantage is taken of the tubular section to combine simplicity and safety with a high degree of portability.

The work bench in Fig. 4 serves a number of purposes in the repair shops of the Royal Canadian Air Force. The columns over the wheels are 2-inch 14-gage welded steel tube and the other two columns are 2-inch 16-gage. It is interesting to note that another design of bench for this same purpose utilizes 3 x 3 x ¾-inch angles for all column members. Angles of that size would weigh about 7.5 pounds per foot, whereas the tubing design illustrated weighs less than 1.5 pounds per foot.. The top and bottom frames are 2 x 1 3/16-inch 16-gage welded rectangular tube. The assembly of tubes shown beneath the end of the table at the left serves as handles for picking up this bench to wheel it around from one location to another. The benches are fitted at the factory with all of the accessories shown before shipment.

Two interesting accessories for outdoor use are shown in Figs. 8 and 5. Fig. 8 is a chock, entirely welded of 1½-inch tubes. When in use on soft ground it rests on the flat ends and on hard ground it gets an equally good bearing by setting up so that it rests on the points. Fig. 5 is a battery carriage for cold weather starting. The lower frame of the box is rectangular tube and the support is a bent piece of round tube which also serves as a conduit for a cable running up to the starting switch which is mounted next to the grip.

Standard designs of tubular furniture manufactured by the fabricating division of Standard Tube are also in large demand in connection with the defense program. Fig. 7 shows how a standard factory stool is adapted for use for bomb-sight practice in aviation by mounting on it a revolving disk with friction stop. Well adapted to use in mess halls, assembly halls and lecture rooms are the nesting chairs shown in Fig. 9 made of ¾-inch 18-gage welded steel tube. Seats and backs are plywood, fastened to the tubing by self-tapping screws.

Common Extinguisher Puts Out Fire Bombs

■ After conducting exhaustive tests under a variety of conditions on actual bombs, Factory Mutual Laboratories, Boston, reports that existing types of fire extinguishers common in most industrial plants and public buildings can be used effectively to cope with light magnesium incendiary bombs.

According to Arthur B. Guise, engineer in charge of tests, water is the wrong thing to use on burning magnesium, but as a practical matter it often is the best. None of the usual fire extinguishers can put out burning magnesium, but where enough extinguishers of the water-filled and soda-acid types are available, they can be used successfully to control the fires.

"A solid stream of water from any source," he states, "when applied directly to a burning magnesium bomb causes an explosion, sending particles of metal for distances of 10 to 20 feet. But a spray may be directed safely upon the bomb, greatly reducing the time of its burning and wetting down the area around it.

"This spray can be produced by inserting the ball of the thumb into the stream from the extinguisher. An adjustable nozzle of a garden hose also will produce the same effect."

Good Mechanics Seldom Get Hurt at Work

■ *A Good Mechanic Seldom Gets Hurt*, by Herman R. Graman; paper, 94 pages, 4¾ x 7 inches; spiral binding; published by American Technical Society, Chicago, for 50 cents

The author makes no claim to presenting new safety rules but has endeavored to take the established rules and organize them so as to give the beginning craftsman an idea of what to look out for when working in a machine shop. The rules have come from the author's personal experience, from foremen and instructors, and others are found in standard text and reference works.

One object of the book is to teach the young worker that he has only himself to blame for injuries resulting from careless practices while at work.

Revised Practice on Cast Iron Radiators

■ A revision of simplified practice recommendation on large-tube cast iron radiators was recently approved by the industry and became effective Oct. 1, further reducing the list of stocks, according to the Department of Commerce, Washington.

Worked out in co-operation with the Division of Simplified Practice, National Bureau of Standards, the revision is identified as simplified practice recommendation R174-41. Its original draft, promulgated as of March 1, 1940, established a simplified schedule of 17 recommended stock sizes of large-tube radiators out of a total of 33 sizes in production at that time. Current revision reduces list of stock sizes to 13 by eliminating the following: 4-tube, 20-inch height; 6-tube, 20-inch height; 7-tube, 17-inch height; and 7-tube, 26-inch height.

Until printed copies are available, mimeographed copies of the practice may be obtained from the Division of Simplified Practice, National Bureau of Standards.

BETWEEN HEATS

WITH *Shorty*

■ Say Fellers:

I was standin' over in the power house recently in front of the switchboard lookin' at some of the new instruments some of the boys in the 'lectrical gang was hookin' up. A couple of the fellers were back of the panel makin' the connections and talkin' a blue streak.

"Hot dickety dog, son. Did I go to town at the Iron and Steel Ingineers show up in Cleveland last month," sez Jim Reese.

"Braggin' ag'in y' ol' plyer wielder. Anyway why don't you say 'Engineers' instead of 'Ingineers,' huh? Ain't y' had any bringin' up?" Tommy Hoon asked.

"O yeh, y' cute little man. Who sez I ain't gotta right to spout out Ingineers from my speakin' tube, huh? Who's sayin' so? If a guy like Julius Clauss, chief ingineer at the Great Lakes plant can git on 'is feet like he did at one of the sessions up at the Iron and Steel Ingineers show in Cleveland last month when he discussed Morgan's paper on sintering plants—if Julius can git up on the platform and say 'Members 'n guests of the 'Sociation of Iron 'n Steel Ingineers,' I guess I kin spit 'er out through my eatin' tube the same as 'im, can't I ol' topper?"

"How'd y' know Julius said that?" inquired Tommy.

"Boy, I jus' told y' I took in the meetin' 'n the show 'n all the trimmin's. Say, let me tellya somethin', son. Julius ain't got any Es in 'is alphabet when he 's talking 'bout ingineers. Gave 'em all to Campbell to put in 'is soup, I guess. 'N I know a lotta fellers that sez ingineers. So ingineers it is."

"Alright, Jim. We got that settled. Now let's take a spell off and y' kin tell me what kind of a show they had and some of the ol' gang who was takin' 'er in," I heard Tommy say.

"Don't mind if I do," sez Jim. "Well, I'll tellya. Me 'n the gang left the plant here Tuesday afternoon 'n we pulled in Cleveland that night 'bout 8 o'clock. Next mornin' Peg Murray —y' know, she 's the one back of the desk who always has gotta smile for y' —she sez, 'Hey ya Jim. Still in the iron and steel business?' "Sure thing, I sez—the Mrs. is doin' the ironin' 'n I'm takin' care of the steelin'." 'Quit your nonsense 'n put your name on the dotted line if y' wanta see the show under the big tent,' she sez. " 'N brother a great show it was."

"Tell me somethin', Jim. Remember how the boss kept sayin' there wouldn't be many of the fellers up at the show cuz they'd be too busy. How 'bout it?"

"Yeah, Tommy, I heard 'im pass out them there words but I'll tellya, there was lottsa guys there chewin' the fat. There was Charlie McGranahan 'n Graf of J. & L., Walter Burr of Lukens, Lew Coffin 'n Fisher of Bethlehem, Frank Flynn 'n Shorty Miller 'n Tull 'n Morgan of Republic, 'n Cramer of Carnegie. Then there was Ford 'n Farrington 'n Moxley of Wheeling Steel, 'n Charlie Betz 'n Julius Clauss 'n some more from Great Lakes, 'n lottsa guys from Sheet & Tube 'n Sharon, 'n Inland. Naw, the boss was wrong. He mustta heard some of that funny band music comin' from them there propaganda guys over in Hitler's meadow, I guess," Jimmy sez.

"What did the guys have to say that were readin' the papers?" asked Tommy.

"P-u-l-e-n-t-y, boy. 'Course I was interested in Morgan's paper on sintering machines cuz I wanted to get some dope on the 'quipment so as when we start buildin' ours over on the other side of the blast furnace stockhouse, I'll know how to keep things movin'. Y' remember Charlie Betz of Great Lakes. Well Charlie was chairman of the meetin' 'n he had a dickens of a time gettin' the discussion stopped. But he turned on the heat 'n the guys stopped jus' in time cuz Morgan was all outta breath but still comin' up fer more."

"Tell me somethin' 'bout the show, Jim."

"Well she wasn't too big 'n she wasn't too small. Jus' right. Plenty of folk millin' 'round the booths. Lottsa business talk 'n gassin' 'bout power house trinkets. A lotta guys were makin' it a rule to return to the Allis Chalmers booth a number of times."

"What was the big idea?" Tommy asked.

"Oh they had a 5-gallon carboy full of tomato juice, plenty of cups in a container 'n all y' had to do was to hold your cup under the faucet, turn on the juice as we say in the shop 'n gulp 'er down—that is, if y' had any gulps left in your gulper."

"All for the purpose of makin' full red-blooded electricians, huh?"

"Naw, not 'xactly. One of the fellers in the booth told me drinkin' water cost 40 cents a gallon and tomato juice 47 cents a gallon. So they filled 'er up with tomato juice. 'What 's 7 cents a gallon,' sez he jus' like that. 'N I guess he had somethin.' One day of the show the gang drank a little over 47 gallons. So if y' see any of the gang with a nice red blush on the cheeks y' kin take it from me they were imbibin' in full strength tomato juice at the show. 'Course there were other palate soothers but the boys were specializin' on tomato juice high balls in paper containers when I saw them."

"Sounds real interestin' y' son of a gun. I suppose y' poured tea?"

"Well not exactly. Y' see there 's 'not a shock in a wire load,' they say, 'n bein' a good electrician, I had to prove it. Y' understand?" sez Jim.

"Yeh. I suppose y' had on your best bib 'n tucker at the banquet and shin dig afterward?"

"Sure did. Wait till I tell y' 'bout one of the fellers from Pittsburgh. He kept takin' pictures of the gang sittin' 'round the banquet tables 'n he never stopped 'til he had used up 'bout 16 flash bulbs. 'N when he reached down in his bag for the seventeenth bulb, there wasn't any bulb but his hand came out holdin' a film pack that should have been in his camera. Was his face red? Well Tommy ol' kid, whadda y' say we get goin' ag'in, huh?" asked Jim.

"Okay," sez Tommy.

* * *

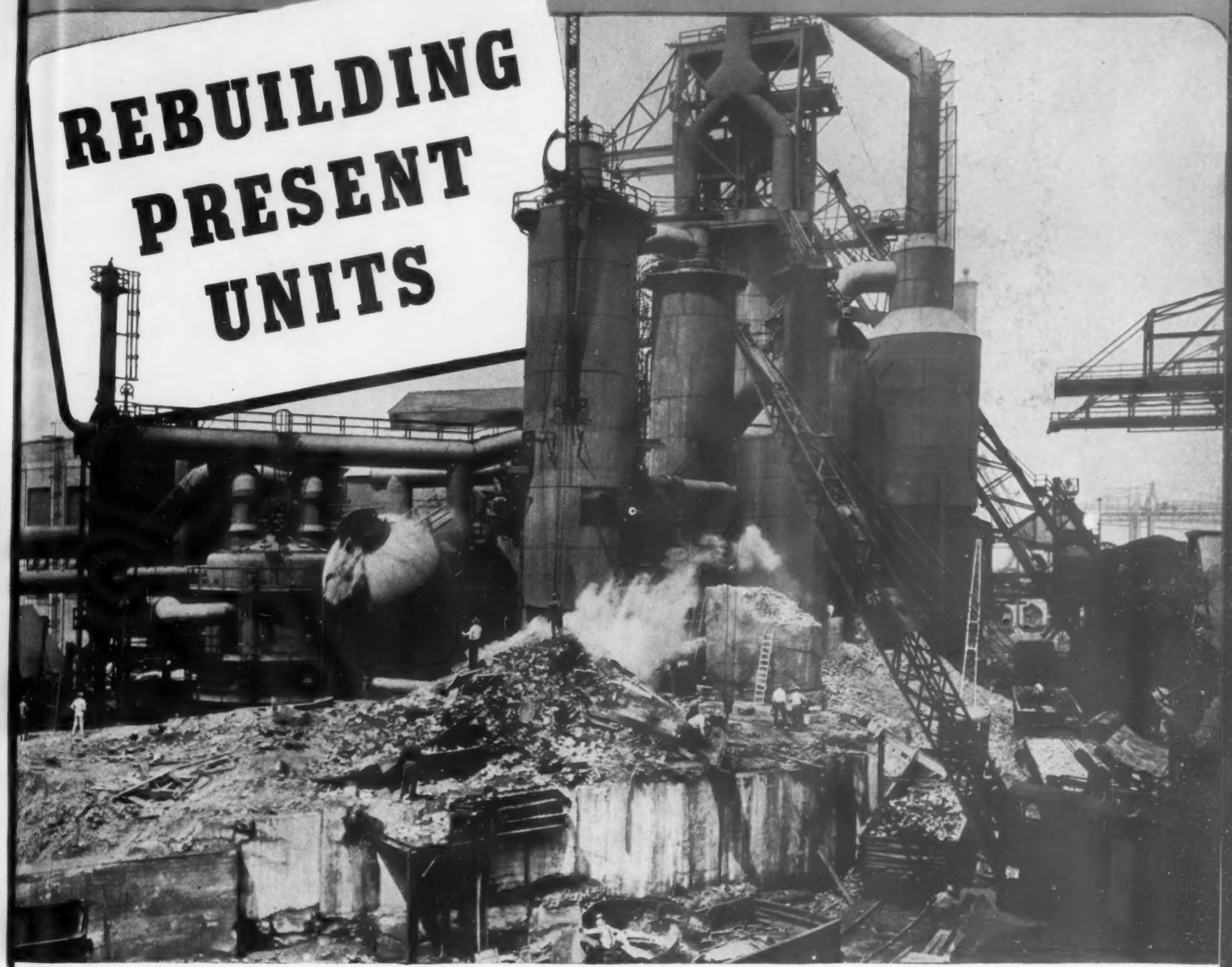
I was glad to have overheard the conversation cuz I believe we've got some new ideas on sintering plants we didn't have 'fore Jim went to the convention. Lottsa times it works that way when your company sends some representatives to the annual meetings. Have y' tried it?

So long, fellers. I'll be seein' ya.

Shorty.

"Shorty" Long

McKee can give you prompt action in



Dismantling existing furnace in preparation for reconstruction.

WHILE the defense program is causing the construction of facilities for enormous *new* capacity, most of today's iron and steel tonnage is being produced by *existing units.*

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COMMERCE BUILDING
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Revamped production aisle in old manufacturing building where all machining and welding is done. Reflectors in far right corner are spun from aluminum disks. This portion of the plant works around the clock

"MATCHING" CENTERS

Expedite Handling of Materials In New Westinghouse Setup

Costing nearly one million dollars, the expansion program recently completed at Cleveland's Lighting Division not only doubled plant capacity, but also provided the unit with a smooth flowing production line. Various "matching" points in the plant's C-shaped layout place the proper material in the right place at the right time

By C. H. SMITH
Supervisor of Time Study
and
R. W. Mallick
Plant Layout Engineer
Westinghouse Electric & Mfg. Co.

Good lighting is extremely essential to both defense industries and military needs. And, the problem at Cleveland's Lighting Division of Westinghouse about 18 months ago was gearing its production up to the anticipated tempo of national defense demands of today.

Ordinarily, the problem of stepping up production is merely a matter of doubling floor space, extending conveyor lines and adding on a comparable working force. But not so at the Cleveland plant. The problem was not so simple. In the first place, lighting fixtures such as for protective lighting, fluorescents for industrial plants, landing field markers, searchlights and units for naval use, in addition to the Precipitron units which also are made here, do not lend themselves to "straight-line" production methods since each order is routed individually. Then again, existing facilities and geographical limitations had an important bearing upon the whole setup.

In spite of these complications, today the Cleveland division with a "streamlined" production line consisting of more than a mile of conveyors supplemented with traveling overhead monorail hoists, electric trucks, tote boxes and other handling expedients, is capable of an output just double that of a year ago, even though actually the facilities were only increased 40 per cent. Of this doubled capacity, more than 75 per cent at present is for defense.

Representing an outlay of nearly a million dollars and over a year's work, the expansion consists of one completely new one-story building, a new boiler house with a new 420-horsepower boiler to augment two existing boilers, two additional stories each to both manufacturing and a foundry building, revamped receiving and shipping facilities and renewed or rehabilitated service facilities.

Ground for the first building was broken in October, 1940. This unit, a one-story concrete, brick and steel building designed for pattern and foundry supply storage, was ready for occupancy Jan. 15, 1941.

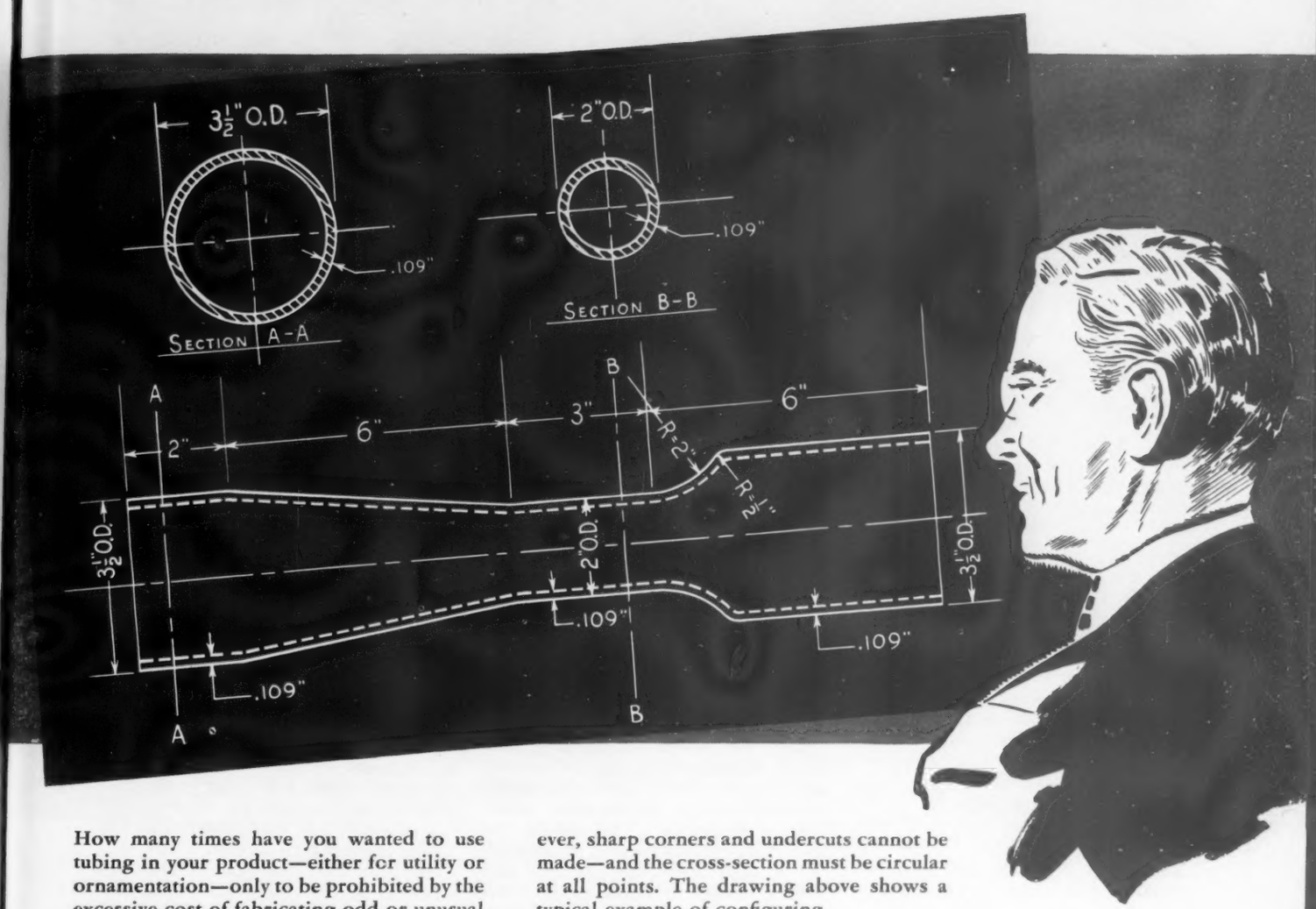
Simultaneously with construction of the pattern storage building, excavation started for the 2-story additions to the buildings which housed the actual manufacturing of lighting apparatus.

Here the problem was not so easy. With a greater backlog of orders than ever in the history of the plant, production had to be maintained in some instances 24 hours per day, and construction problems had to be subordinated to production. Despite January weather one end of the factory was completely demolished and exposed to permit new construction, both production and construction proceeding on schedule.

To keep production moving, the newly completed pattern storage building was temporarily turned over to the factory for use as an assembly plant. Five conveyorized lines were put into operation with a total capacity of 500 fluorescent fixtures per 8-hour shift. Thus it was possible to manufacture and ship on time such orders as lighting

Configured Tubing

TAKES THE BRAKES OFF TUBING DESIGN!



How many times have you wanted to use tubing in your product—either for utility or ornamentation—only to be prohibited by the excessive cost of fabricating odd or unusual shapes? How often have you overlooked the possibilities of tubing, because you thought it too difficult or expensive to form?

If you can say, "At least once," to either question, you should know more about CONFIGURED TUBING—the latest development in tubing fabrication.

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Because it is a cross rolling process, however, sharp corners and undercuts cannot be made—and the cross-section must be circular at all points. The drawing above shows a typical example of configuring.

Present equipment limits length to 20 feet, maximum outside diameter to 4″ and wall thickness to .165″—with smallest limit of finished size ¼″ O. D. by .049″ wall. This range will be extended as engineers are ready to investigate and apply the almost limitless possibilities of CONFIGURED TUBING to their designs and shop problems.

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Nearly a mile of conveyor lines are in three of the new buildings to "streamline" production. The conveyor at right carries single-tube fluorescent fixtures; center line is for packed sterilamps, and conveyor on the left carries 4-tube fluorescent fixture assemblies. All three lines move toward the packing room from which they proceed to the shipping room, store room or warehouse

equipment for Wright Aeronautical Co. at Lockland, O., which required about 18,000 fluorescent fixtures.

Due to space limitations, existing building, and transportation facilities, to obtain the most efficiency from the new layout a C-shaped material flow was established. Raw materials are received into the plant by both rail and motor truck. Since it is always most desirable to have all material received at one point, the receiving department was located at a point which would have both these facilities. The same was true of shipping. In the case of shipping, however, the problem of shipments from warehouse as well as direct shipments from the factory had to be considered since nearly 50 per cent of the volume shipped originates as warehouse stock. And since the 8-story building is used as the warehouse, it was most advantageous to ship from this point.

These two "anchor points", the receiving and shipping activities, were most nearly fixed by geographic limitations, and the problem then resolved itself into obtaining the most efficient and adequate layout possible between these two points.

Because the type of product handled at this plant does not lend itself to manufacture in a multistory building with any degree of efficiency, the problem remained of getting a sufficient amount of floor space under one roof and between the two fixed points to accommodate the productive capacity required. Also, in the new layout it was deemed advisable to revise certain manufacturing processes and methods to allow for better production and cost control as well as to obtain a better productive flow of materials.

After careful study, the raw material storeroom was located immediately adjacent to the receiving department since 85 per cent of the material entering into the product is handled through this storeroom, while only 15 per cent goes direct to the shop. To allot all the required space necessary to raw material stores would have left little space for manufacturing and other succeeding activities.

After further analysis, the storeroom was divided into two categories; one consisting of relatively heavy and active materials with rapid turnover, and the other consisting of relatively light materials of slower turnover. By such a division and using mechanical handling equipment it was found that storing the slower moving, lighter materials on a second floor would be no detriment. This led to the designing of the 2-story factory addition which, in turn, provided sufficient space to accommodate the layout previously determined from production requirements.

The majority of the apparatus manufactured in this plant does not lend itself to "straight line" production. Although nearly all designs are standard, customers very frequently specify some special feature to accommodate an architectural requirement such as special finishes or hardware, or local building codes may necessitate a change from standard design.

A study of production conditions and material flow revealed that by interposing "matching centers" for material at certain points in the layout between successive manufacturing operations, a nearly "straight line" flow could be obtained. Thus the principle of progressive flow with lateral feeders was applied to the layout, the feeders consisting of overhead hoists traveling on moving overhead bridges or other suitable handling expedient, depending on the product handled. The "matching centers" serve to "take up" slack and smooth out interruptions and, in addition, eliminate most delays due to having the proper material in the right place at the right time. Material is received either by truck or rail in the receiving department. Every piece of material is checked, then sent to the raw material storeroom, production dispatch station, or finished parts storeroom, depending upon the type of material and where it enters into process.

Suppose we follow a hypothetical product through a typical manufacturing cycle. Let us assume that it originates as raw material in the raw material storeroom. The correct quantity and size of material is sent by the storeroom to the production dispatch station. The storeroom cuts, shears, weighs out, or otherwise supplies the correct amount for a given order. The material is then sent by conveyor or caster truck to the dispatcher.

When all the material required for the first operation is on hand, the dispatcher routes the order to the manufacturing department, usually with drawings and tools necessary to perform the specified operations. If the material can be accommodated in tote boxes, it is sent by conveyor, automatically controlled from the dispatch station. If the material is too large for tote boxes, it is delivered on caster trucks by a move man. By this means, the dispatcher can control production very readily. The shop can work on the various orders in the proper sequence since only such work is dispatched as may be required and all other material is held in the dispatch station. This then

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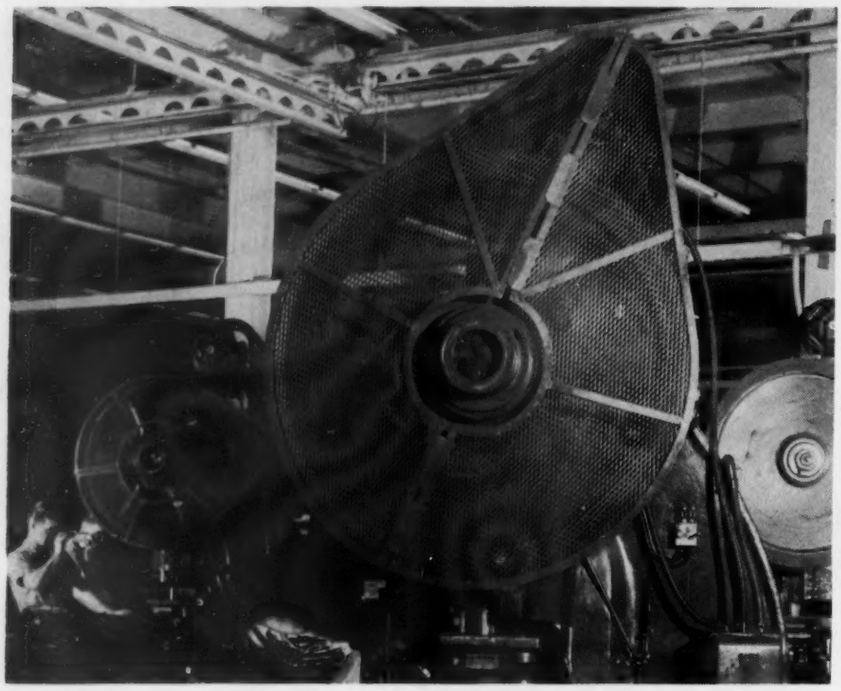

Small pieces such as housings and covers are stamped out by these machines. The three presses are fed by new type adjustable height racks. Note overhead monorail tracks for traveling overhead hoists which supplement conveyors

becomes the first "matching point" in the layout.

After the specified operations are completed on the first assignments, the material is returned to the dispatch station, usually by trucks or caster skids, for reassignment until all so-called "feeder operations" are completed. These may be any or all of the following processes: metal stamping, machining, spinning, welding, subassembly, cleaning, plating, painting or polishing. The dispatcher has full control of work assignment and in this way can route jobs to the best advantage and stabilize the work in the shop as well as give preference to specific orders.

Should any one department be low on work, he may start out jobs that may not be required immediately, then hold the parts in the dispatch station before routing for succeeding operations. Or, he may hold up less important orders to give way to urgent work.

When all "feeder operations" have been completed, the material is sent to the finished parts storeroom or dispatch station No. 2, depending upon its classification. Material that is made for stock and carried on ledgers is held in the finished parts storeroom until requisitioned. If it should apply on a customer's order, it is sent to the dispatch station for matching with other parts applying on the order, and is held there until it can be released for assembly and shipment. This now becomes another "matching center."

As mentioned previously, most so-called "standard fixtures" must have certain special features to satisfy customers' needs. Several years ago an analysis was made to determine how many component parts of each assembly were interchangeable on similar apparatus. The survey revealed that from 85 to 95 per cent were standard, and this led to a policy of stocking parts rather than finished units. Stocking parts gave the advantage of lessening large warehouse stocks of finished units and quicker service to customers, as it was often necessary to dismantle a finished unit to bring it up to order specifications.

When an order is ready to assemble, the dispatcher collects all of the special material required for the order and requisitions the stock parts from the finished parts storeroom, which is located adjacent to the dispatch station. When all is in readiness, he sends the order by caster skid to the head of the assembly lines.

With exception of such apparatus that cannot be moved on conveyors due to physical dimensions or design, all assembly is done on roller-gravity conveyors. Each unit is assembled progressively and, after the final operation, is inspected and ready for packing. The assembly conveyors extend to the packing floor, and this operation is also done on conveyors or special benches designed to keep all material within the effective working radius of the operator.

Lighting fixtures, as a rule, can be easily damaged in handling. This means that packing is a relatively important operation and requires a considerable amount of bulky materials. Due to the volume handled, the stock of materials necessary to keep on hand is quite extensive, and this is one of the principal items which were placed in the storeroom on the second floor of the new addition. However, the problem remained of getting the proper materials in the correct quantities to the packing floor at the right time so that units coming off the assembly line could be packed without delay.

A belt conveyor was installed to accomplish this, and by arranging a switch and spur to the No. 2 dispatch station, materials entering into the assembly that are stored in this storeroom unit are carried by the conveyor directly to the shipping floor.

After the material has been packed, it is turned over to the shipping department, located on the same floor, for shipment or warehousing. If same is for warehouse stock, it is transferred by caster truckload on an elevator to the upper floors, which are used for that purpose. If it goes into direct shipment, it is moved to the loading platform which has been designed to accommodate six trucks and one freight car at one loading. Here at the loading platform as at the receiving end, an overhead hoist traveling on a monorail bridge is available to expedite handling of heavy and odd shaped material.

New Color System Aids Machine Operators

■ Light buff and light gray machine finishes are the best colors for reducing operator eye fatigue according to a report presented at the recent Atlanta meeting of the Illuminating Engineering Society. Presented by Arthur A. Brainerd, Philadelphia Electric Co., and Matt Denning, of the Finishes Division of Du Pont, the report also revealed that aluminum stood very high as a satisfactory finish with light blue showing promise.

Most important, however, the collaborative 2-year investigations conducted by these two men showed that by compromising—that is painting all machines in "horizontal gray" and "spotlighting" the working area with light buff, better performance ratings were obtained than with any of the solid colors.

At the meeting, studies of how brightness and contrast in paint colors on machinery combined to increase the accuracy of seeing, reducing accident hazards, providing more comfortable working conditions, and also increasing production were presented in a color motion picture.

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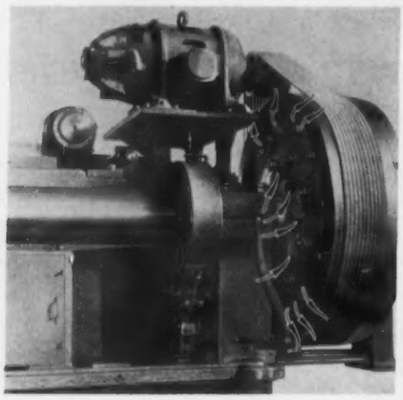
Air-Cooled Clutch

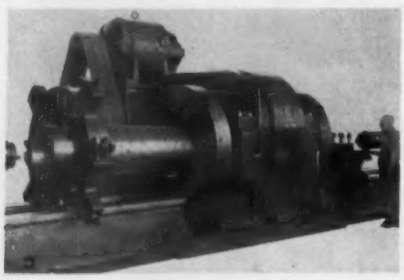
■ Ajax Mfg. Co., 1441 Chardon road, Cleveland, announces the incorporation of a new air-cooled clutch on its forging machines, which with its double-draft ventilation is said to increase the efficiency of the clutch greatly. The clutch is housed within the flywheel which is mounted between



widely spaced antifriction bearings. The latter, which are easily accessible for lubrication, have labyrinth grease seals and overflow discharge ducts which prevent lubricant from entering clutch plates. Clutch-cooling air is pulled in by scoops at the hub on both sides of the flywheel, forced out centrifugally between the friction surfaces of the clutch plates, and discharged through openings in the outer clutch housing just inside the flywheel rim.

Boring Lathe

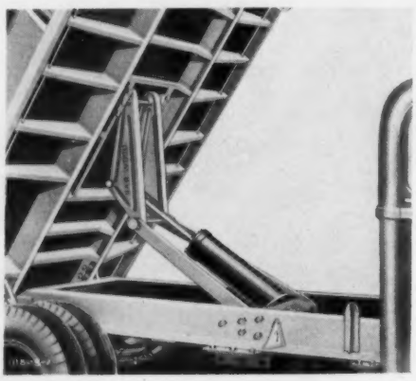
■ Wickes Bros., Saginaw, Mich., announces a new double end boring lathe for boring hollow steel forgings such as torpedo air flasks and guns. Measuring 30 inches by 25 x 25 feet, it is equipped with a 30-inch hollow spindle and 25-foot length of bed on each end. To bore the hollow forgings from both ends simultaneously, each end of the bed is equipped with a 12-inch by 20-foot



forged steel boring bar. The machine is arranged with independent feed box on each end, driven by a variable speed direct-current motor, and with power rapid traverse. The main drive motor is of the 50-horsepower variable speed type having three mechanical speed changes in the headstock. The forged steel work-piece is supported in, and driven by the face plates on either side of the center drive headstock, and also supported in the 4-jaw steadyrests. A portable spotting carriage is provided for preliminary work on the end of the forging. The lathe, with electrical equipment weighs 183,000 pounds.

Hydraulic Hoists

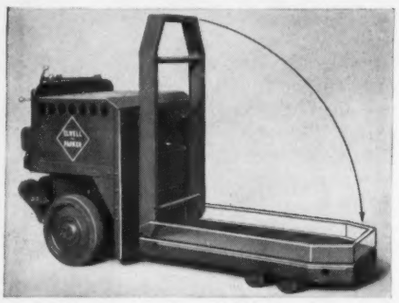
■ Gar Wood Industries Inc., 7924 Riopelle street, Detroit, has introduced several new arm-type hydraulic hoist models for installation on 1½ to 2-ton truck chassis. They are especially adaptable for use in connection with dump bodies from



8 to 10 feet in length. Manufactured in three sizes, D6R, D7R and D7LR, these hoists involve a new type of lifting arrangement. Besides, the lifting effort is reduced considerably, due to the body being lifted further forward, and also is disseminated over a greater area. The hoists provide faster operation and minimum stress on truck frame. They also have longer lever arms and fewer working parts.

Industrial Truck

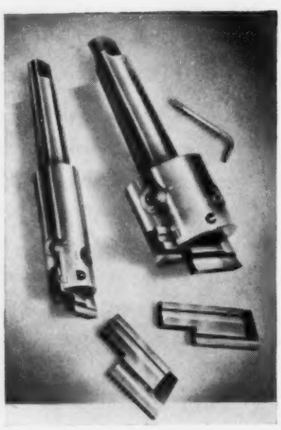
■ Elwell-Parker Electric Co., 4205 St. Clair avenue, Cleveland, announces that a recent addition to the platform structure of its type EP-4 power industrial truck now enables the operator to pick up, transport and place loaded skids having various under-clearances, without wasting time. The standard height of truck platform is 6 inches above floor, with a 4½-inch lift. This permits lifting and handling skids having an under-floor clearance of 7 inches. To handle skids of greater



height, a hinged frame or superstructure is lowered from its vertical position, increasing the platform height to 11 inches at normal, and 15½ inches when raised. The truck itself is designed for storage battery operation. Its rated capacity is 4000 pounds and its travel speed under load is 4¾ miles per hour. Dynamic brake supplements friction brake, and foot pedals are interlocked with the drive controller. When depressed, one pedal closes the power circuit while the other releases brake.

Spotfacer, Boring Tool

■ Bokum Tool Co., 49 West Hancock street, Detroit, has placed on the market a B & B spotfacer and



boring tool which is said to perform more accurate work with fewer motions. It consists of a

Equipment

head (or bar) with a cutting blade running through a slot at the end of it at right angles. Located on the head is a dial with micrometer readings which enable the operator to set and lock the blade securely to precise diameter measurements within ten-thousandths of an inch. The tool is made in three models with standard blades providing a range of boring diameters up to 22 inches. With the aid of a standard small tool adaptor the same tool can be used to bore holes as small as ¼-inch in diameter.

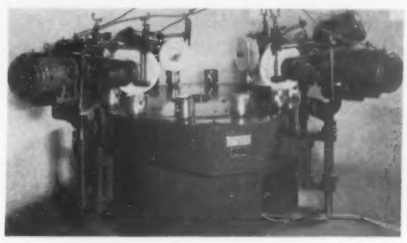
Receipting and Check Writing Machine

■ Burroughs Adding Machine Co., 6071 Second avenue, Detroit, announces a new automatic machine which gives increased protection, speed and economy to bill receipting

—check writing and signing. The operator merely slides the check or receipt into the chute, indexes amount on the keyboard and depresses the motor bar. Both the signature die and the accumulated total gures are under lock and key, and the machine itself can be completely locked to prevent its use by an unauthorized person.

Polishing Machine

■ Udylite Corp., 1651 East Grand boulevard, Detroit, announces an automatic polishing machine for buffing aluminum aircraft engine pistons. Claimed to have reduced production time, 97½ per cent in comparison with the old-fashioned method of buffing pistons by hand, it buffs the sides and top in 15 sec-



onds. The machine consists of an index table which indexes automatically. Twelve chucks hold the pistons which rotate during the buffing operation. These are stationary during the indexing period and during the loading and unloading. Six buffing pedestals are arranged around the machine to accommodate buffing wheels which are driven through a V-belt drive. Buffing pressure is adjustable by means of tension spring so that the buff rides over the work. The machine may be adapted to a variety of circular parts merely by changing work holding chucks or fixtures. Only one operator is required to load and unload the unit.

Plastic Goggles

■ B. F. McDonald Co., 1248 South Hope street, Los Angeles, has introduced new type goggles for workers engaged in grinding, chipping or other operations where flying objects or particles are an eye

hazard. Known as I-Gards, they are molded of a special clear plastic. Lack of frames and side-pieces affords unrestricted wide angle vision, provides the same protection from obliquely flying objects that cup goggles give the wearer. Because the light plastic lenses fit snugly around the eyes there is no pressure on the bridge of the nose, and none on the ears. Fogging is minimized, and adequate ventilation is provided. The goggles are non-shatterable, and strong enough that they will pass the standard drop test. They are offered either with clear lenses or in green Vernalite, a tint which stops most infra-red and ultra-violet rays.

Milling Machine

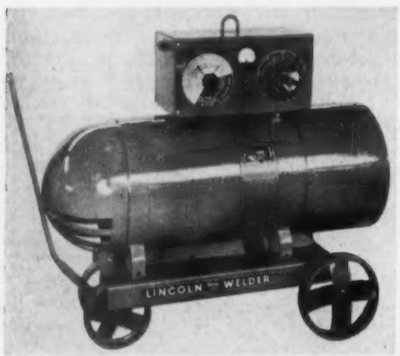
■ Van Norman Machine Tool Co., Springfield, Mass., has introduced a new No. 118 automatic bed-type milling machine with hydraulic table feed for high production milling of small and medium-sized parts. Its spindle transmission, located in a compartment at the rear of the bed, is driven by a 3-horsepower motor, hinge-mounted to facilitate belt adjustment to the main drive pulley. Spindle-speed changes are obtained through pick-off gears accessible in a housing at the rear. A spindle speed plate located on the door of the pick-off gear housing, lists the gear combinations required for obtaining any of the twelve speeds which are ar-

ranged from 30 to 1000 revolutions per minute in geometric progression. The spindle head slide is mounted on heavy box-type ways, cast integral with the upright column. A large handwheel, with graduated dial raises and lowers the head slide. The hydraulic mechanism for operating the table comprises a pump and main control panel, together with necessary valves, all of which are located in a compartment at the front of the machine. The spindle clutch of the machine is operated hydraulically by means of a clutch lever located in a panel at the right front side of the machine. The machine, however,

can be provided with an automatic spindle stop. The normal cycle of the machine is rapid-traverse advance, normal milling feed, then an automatic rapid-traverse return to the starting position. Lubrication of the table is by means of a one-shot oiling system located at the front of the machine. The spindle quill is lubricated through an oiler at the rear top surface of the quill. The high-low range gears, located in the spindle gear housing, are provided with splash lubrication. The machine occupies a floor space of 65 x 46 inches. Its total height is 61 inches.

Welder Control Box

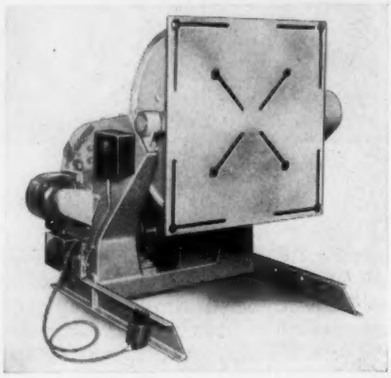
■ Lincoln Electric Co., 12818 Coit road, Cleveland, announces a new type G welder control box of advanced design and construction which prevents accidental contact with live parts, and increases accessibility. Its important feature is the fact that there is a separate compartment for all alternating current circuits, including push button, and another separate one for direct-current terminals. Both compartments have a snap catch which holds the



door in closed position. The alternating-current compartment door also has screws for locking. The catch, however, holds the door in closed position in case the screws should accidentally or temporarily be left out of their proper places. On the direct-current compartment, the snap catch feature of the door makes the terminals readily accessible without use of tools. Another important feature of the control box is the improved lifting hook. This eliminates all risk of the hook being unscrewed. Special nonshorting lugs, which lock themselves in proper position before they can be bolted to the input terminals of the starter, prevent possibility of blowing up the input lines. The control box is permanently grounded to the motor and generator frames through mounting bolts.

Welding Positioner

■ Industrial Division, Ransome Concrete Machinery Co., Dunellen, N. J., has introduced an improved heavy-duty 300-pound capacity welding positioner for facilitating welding of heavy units. It features a 40-inch square machined steel tabletop provided with four radial and



four longitudinal T-slots to take ¾-inch bolts, enabling pieces to be welded to be set up quickly. The positioner is of all-welded construction. Its table, by means of the machine's tilting motor, can be tilted from horizontal to 45 degrees beyond vertical. In addition, the table top may be rotated at constant speed or variable speed as desired.

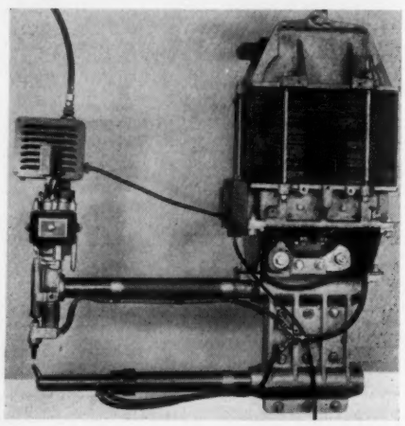
Grinders

■ Hammond Machinery Builders Inc., 1611 Douglas avenue, Kalamazoo, Mich., announces three new, functionally "modernized" OK model grinders for tool and light snagging grinding. These stress oversize construction for all moving parts such as spindles and bearings.

Base of each machine is of heavy cast iron with straight vertical lines unbroken by protruding parts. Its motor, a heavy-duty type, is for handling 10, 12 or 14-inch wheels. Other standard equipment consist of push button starter with overload protection; heavy, exhaust-type semisteel guards; adjustable spark deflectors; tool tray and removable water pot; and adjustable tool rests. The grinders also are furnished as a combination grinder-buffer, or with each end of the spindle extended to form such a lathe.

Welding Machines

■ Progressive Welder Co., 3050 East Outer drive, Detroit, is offering a line of portable welding machines, with built-in transformers for use on monorails. Machines in the line are a cross between pedestal and gun welders. Like welding guns they may be moved or swung around to bring the gun to work, and like pedestal welders they have rigid arms with a high degree of throat depth. They are obtainable in a complete range of sizes from 35 to 400 kilovolt-amperes and with



arm lengths ranging up to a maximum of 36 inches of throat depth. Arms are adjustable as to length. By sliding them in or out of the support housing below the transformer, they may be adjusted to a definite electrode distance from the support housing. Both arms are rigidly supported in the housing. The movement to bring the electrodes together is incorporated in a gun mounted on the tip end of the upper arm. The latter is air operated, with the pressure cylinder, solenoid operating valve, and control circuit pressure switch mounted directly on the gun itself. Electrode tips are water cooled, and foot controls are connected by flexible cable to control circuit junction box mounted on the transformer.

Thread Gages

■ Detroit Tap & Tool Co., 8432 Butler, Detroit, announces a line of high precision thread gages for checking both internal and external threads on various sizes and types of shell.

Plug gages for checking internal threads are of the reversible type, while ring gages are adjustable and may be reconditioned and re-set when worn with the use of setting-gages.

"Spare Those Ways!"

(*Continued from Page* 57)

depends the ability of hundreds of thousands of pounds of machine tools in a typical defense plant to turn out acceptable aircraft engines, small arms, big guns, fire control instruments and all other Army and [illegible] *materiel.*

Machine tool builders have attacked the problem of "slide accuracy preservation" primarily from three directions: First, by using hardened surfaces designed to resist wear and abuse; second, by affording adequate protection to these surfaces where possible; and third, by various methods of chip and dirt expulsion. In the first-mentioned direction flame hardening of cast iron, and various methods of applying hardened and ground steel rails and strips to cast iron beds, lately have contributed much toward making machine tools ways durable and foolproof.

No Excuse for Abuse

However, don't take that word "foolproof" too literally. The fact that a machine tool has hardened ways should not be accepted as a valid excuse for abuse of those ways by operators, any more than the fact that an automobile has safety glass windows should be accepted as an excuse for throwing stones at it.

The practice of rapping out files and dropping chucks and work on flame hardened or hardened steel ways of a modern lathe or turret lathe is fully as reprehensible as similar practice in the case of any other lathe. It damages the file and it damages the chuck and work; certainly it doesn't do the lathe any good, and it marks the operator with the same stigma as that which marks the half-wit who deliberately drops castings on his fellow workmen's feet on the assumption that they are wearing safety-toed shoes.

The most common form of protection is the so-called "covered way," of which numerous ingenious variations have been worked out. A good example is given in Fig. 1, which shows one method employed by Barber-Colman Co. on their hobbing machines. Because of the fact that there is here no interference with the frame of the machine, substantial one-piece inverted troughs can be bolted to the ends of the hob slide so as to cover the ways on the bed throughout the entire travel of the slide.

On certain of its turret lathes, Warner & Swasey Co. employs similar one-piece inverted troughs attached to the turret slide. By a patented system of design these troughs are enabled to pass under the cross slide and into tunnels under the headstock, thus giving full way protection regardless of the position of the turret carriage and cross slide on the bed.

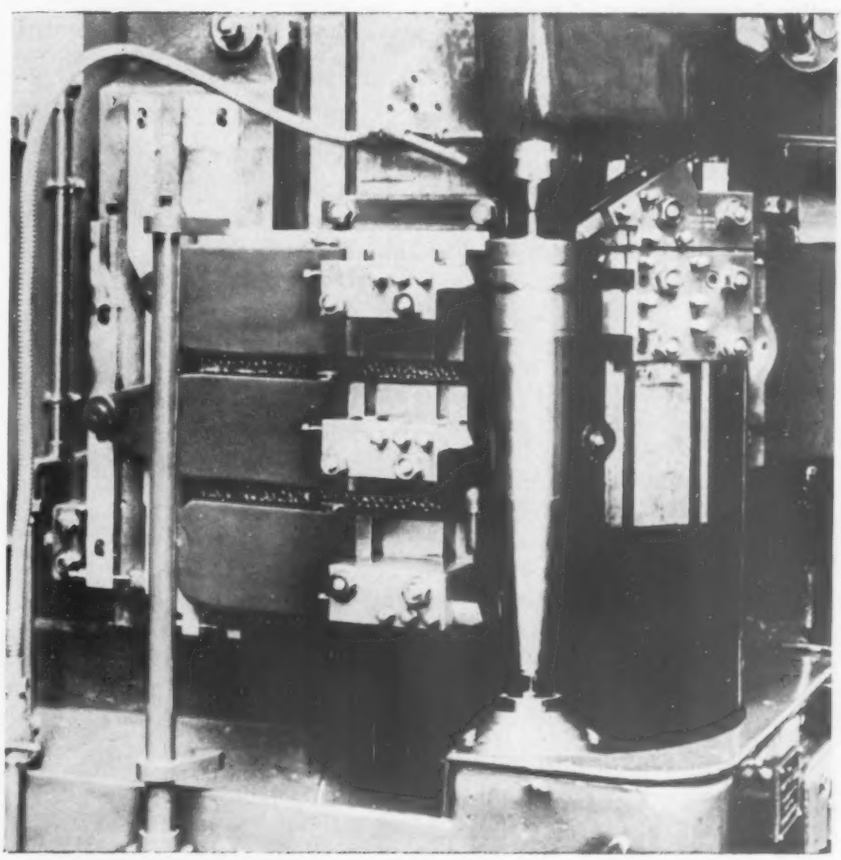
In cases where slide covers cannot be projected beyond the bed, some form of telescoping design often is employed. A good example of this is depicted by Fig. 4, which is an end view of the Newton Mill-N-Shaver built by Consolidated Machine Tool Corp. It will be noted that the sections of the cover, of which there are duplicates at the other end of the machine, are designed to slide one over the other as soon as the outer section contacts the cross member of the bracket on the end of the bed.

Incidentally, a word about this machine itself is in order because of its unusual cutting action. The initial or roughing cuts are accomplished by revolving face mills, just as in the conventional planer type milling machine. On the return stroke, however, tool marks are removed and the work brought to exact size, by wide shaving blades whose heads are advanced into cutting position hydraulically just as the high speed return stroke of the table begins. One of these shaving blades, in its relative position to its companion milling cutter, can be seen clearly in the illustration. This represents a noteworthy example of elimination of "idle time" from the operating cycle of a production machine tool.

Another version of the telescoping cover idea is that employed by Bryant Chucking Grinder Co. for protection of the overhead precision slide bar by which the grinding head of the machine is suspended and by which it is traversed. In this instance—as is apparent in Fig. 2—the action of these two tubular covers is exactly like that of their namesake the telescope. Experiments were tried on this machine with collapsing guards of pleated or "accordion" type but this telescoping design has proved to be more satisfactory, as well as better looking.

An extremely simple form of bed way protection—but at the same time a surprisingly effective one—

Machining Anti-Aircraft Shell in England



■ **"Formers" and tungsten carbide cutting tools are speeding production of anti-aircraft shell in Great Britain. Above is a closeup of a No. 12 Rydermatic shell lathe (British) being used for finish turning 4.5-inch shell, including the driving band groove. Note triple "former" slide control employed to regulate movement of carbide tools, at left, used for turning the shell. The tools themselves are of Wimet tungsten carbide, produced by A. C. Wickman Ltd., England. Tungsten-carbide powder is supplied to Britain by Carboloy Co. Inc., Detroit**

is that shown in Fig. 3, as applied to a Gray variable voltage drive open-side planer. This consists of a double-sloped sheet steel trough—of which one is bolted to each end of the planer table. Chips and dirt brushed off over the ends of the table fall into the trough and thence onto the floor, instead of falling into the very vitals of the machine, which in truth expresses the importance of the accurately finished but unavoidable exposed ways of a planer bed. This same idea—modified to suit conditions—can be applied to many other types of machines not originally equipped with way protection.

When it comes to chip and dirt expulsion, there are just about a-hundred-and-one ideas as to how it should be done. However, there is one basic rule upon which any successful method must be based. That rule is, "You can't keep the stuff from trying persistently to get in, so you just have to keep pushing it out." Regardless of packings, seals, wipers, etc., fine chips and abrasive dirt will persist in working their way in between slides and into bearings. The answer to that challenge is to keep pushing these foreign substances out again by pressure lubrication, by ample flow of coolant, or possibly by air pressure.

This in turn means constant attention to the lubrication of the machine. It means constant care on the part of the operator to see that chips and dirt do not accumulate at vital points where they may tend to choke things up. This last is doubly important on the older models of machine tools—many of which are not equipped for pressure lubrication of slides and bearings, or with coolant systems of generous proportions.

The day may come when ways and means will be found to give 100 per cent protection to all ways, slides and other bearing surfaces in all machine tools. For the time being, however, we must take better care of what we have—recognizing the fact that some of our existing machine tool equipment is not exactly 100 per cent in that respect. Just now the problem is an educational one. It can be licked by making the following command a "must" in machine shops throughout America —"Workmen, Spare Those Ways!"

Fine Cavities in Metal Traced to Gas Content

■ Unsoundness in the skirts of small 12 per cent silicon-aluminum alloy pistons take the form of fine cavities in positions remote from the runner and riser. This fact was announced by R. T. Parker, research metallurgist, Research & Development Department, Northern Aluminum Co., Ltd., Banbury, England, at the thirty-third annual autumn meeting of the British Institute of Metals, London, Sept. 17.

Comparison of atmospheric conditions with the percentage of scrap obtained in the foundry showed only a vague relationship. Over periods of some weeks, increases in the atmospheric humidity were followed by general increases in the percentage of scrap, while in several instances daily sharp variations in the humidity were followed by sharp changes in the percentage of scrap.

A brief examination of a piston after diamond machining showed that small cavities may be disclosed or concealed according to the technique followed.

Experiments Give Differences

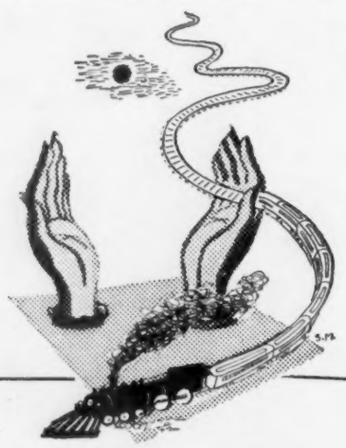
Two experiments in which pistons were cast from metal having a high or low gas content into a die-assembly fitted with thermocouples, demonstrated clearly the effects of variation in the gas content of the metal and temperature of the die-assembly. X-ray methods proved far more useful in assessing the soundness of the pistons than micrographic methods. A well-marked relationship between soundness and die-assembly temperature was observed, the hotter assembly giving the better results. With metal of both high and low gas content, pistons of reasonable soundness were obtained at high assembly temperature; but at low assembly temperatures the metal of low gas content gave pistons of inferior quality containing localized unsoundness. Pistons from metal of high gas content contained unsoundness of a finer and more general type, owing to the dispersive effect of the gas present.

The variation in gas content, therefore, explained the difference in the type of unsoundness observed. Variations in the humidity could be admitted as only partly responsible for a hitherto unexplained periodicity in incidence of the unsoundness. Variations in machining technique were considered of much more importance in this respect.

The relationship between die-assembly temperatures and soundness of the pistons points to a way of obtaining an immediate improvement in quality, although a coincidental improvement in quality of the metal also is desirable.

E. Liddiard, British Nonferrous Metals Research Association, pointed out that gas is not the only cause of unsoundness; holding the metal in a pot for a length of time affects the grain size. Density determination should be used in such investigations as it gives a good measure of porosity.

Doubly handy



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ROYAL CANADIANS IN THE GRILL

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MADISON AVE. AT 45th ST., NEW YORK

Direct Entrance from Grand Central Terminal

Scrap Shortage, Labor Threaten Steel Output

Current situation relieved but future not clear. Closed shop campaign cuts production. New iron ore record already established

MARKET IN TABLOID ★

Demand
Civilian consumer inquiry less.

Prices
Steady at ceiling levels.

Production
Rose 2 points to 96½ per cent.

■ THREATENING labor conditions and continued shortage of steelmaking scrap cast their shadows over the steel industry, with possibility of steel production being severely curtailed before the winter is over.

At the moment the Chicago district is the focal point in the labor situation, the short interruption of a week ago, which cost considerable production, being followed by various movements looking toward a closed shop and fraught with dynamite as they develop. Results of the campaign in that district are expected to be followed by similar tactics in other centers. A Detroit producer is strike-bound, with two blast furnaces and fifteen open hearths down.

Unsettled strike against a Cleveland builder of automobile frames has caused at least three automobile builders to cease production, much of their output being for defense. Various other labor interruptions are taking place, the aggregate causing a great loss of production.

Currently steelmaking scrap is in an easier position, though the long-range prospect is little changed. Slightly more remote scrap is moving from the West and some material held for expected higher prices is being released. An eastern steelmaker last week appealed to Washington to avert sharp curtailment in its open-hearth department and orders were given to nearby dealers to move supplies at once. A tonnage from the Philadelphia navy yard was also shipped. The relief is only temporary unless general supply is increased. The scrap industry is moving to meet requirements of the recent priority order, but it is too soon to evaluate its effects on the situation in general. One result will be a better distribution and shipments will be to those most in need. With winter at hand and reserves low, the outlook is dismal unless the current movement is sharply increased. The next few weeks will determine whether the supply is definitely too low to meet steelmaking demands, as seems probable.

Automobile production last week was the largest in several weeks, indicating the new model season is gaining headway. The week's output was 85,600 units, 6535 more than 79,065 in the previous period. This compares with 114,672 cars produced in the corresponding week a year ago. Doubt is expressed that this rate can be maintained and it is believed automobile builders will be unable to obtain sufficient steel to produce as many cars as allowed under the reduced schedule allowed by OPM.

Decision by SPAB to allow no construction except for national defense or health and safety of the public has had no direct effect so far though its implications have caused some work to be abandoned. It is understood strict application is not to be made on projects well advanced and these may be completed. Sufficient defense building is in hand to keep structural mills and fabricators busy over an extended period, the former now being crowded to make deliveries in time to meet erection schedules.

Possibility of lend-lease purchase by Great Britain of 200 light locomotives, 20,000 freight cars and 250,000 tons of steel rails for use in Iran to carry war supplies to Russia overhangs the railroad situation. The purchase depends on progress of the campaign in Russia. If consummated it would defer deliveries to American railroads.

Production advanced 2 points last week to 96½ per cent, the principal factor being resumption at Chicago after labor interruption. The rate there advanced 10½ points to 101 per cent, from a revised rate of 90½ per cent the previous week. Cincinnati gained 6 points to 88 per cent and Cleveland 1 point to 99 per cent. Pittsburgh lost 1 point to 98 per cent, Detroit 23 points to 68 and Wheeling 3 points to 93 per cent. Other centers showed no change from the previous week: Youngstown, 98; New England, 90; Buffalo, 93; Eastern Pennsylvania, 93; Birmingham, 95 and St. Louis 83.

Movement of Lake Superior iron ore already has passed the high mark set in 1929 and unless late weather conditions are bad it seems likely 79,000,000 tons will be moved this year, which would set a mark 14,000,000 tons above the previous record. Great Lakes fleet is 100 per cent active, with 292 ships in the ore trade, this condition obtaining since May 1. This season 17 Canadian ships have aided in ore transport.

Under ceiling price restrictions composite prices necessarily hold unchanged, finished steel at $56.60, iron and steel at $38.15 and steelworks scrap at $19.16.

COMPOSITE MARKET AVERAGES

	Oct. 18	Oct. 11	Oct. 4	One Month Ago Sept., 1941	Three Months Ago July, 1941	One Year Ago Oct., 1940	Five Years Ago Oct., 1936
Iron and Steel	$38.15	$38.15	$38.15	$38.15	$38.15	$38.07	$34.67
Finished Steel	56.60	56.60	56.60	56.60	56.60	56.60	53.90
Steelworks Scrap..	19.16	19.16	19.16	19.16	19.16	20.70	16.65

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Oct. 18, 1941	Sept. 1941	July 1941	Oct. 1940
Steel bars, Pittsburgh	2.15c	2.15c	2.15c	2.15c
Steel bars, Chicago	2.15	2.15	2.15	2.15
Steel bars, Philadelphia	2.47	2.47	2.47	2.47
Shapes, Pittsburgh	2.10	2.10	2.10	2.10
Shapes, Philadelphia	2.215	2.215	2.215	2.215
Shapes, Chicago	2.10	2.10	2.10	2.10
Plates, Pittsburgh	2.10	2.10	2.10	2.10
Plates, Philadelphia	2.15	2.15	2.15	2.15
Plates, Chicago	2.10	2.10	2.10	2.10
Sheets, hot-rolled, Pittsburgh	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Pittsburgh	3.05	3.05	3.05	3.05
Sheets, No. 24 galv., Pittsburgh	3.50	3.50	3.50	3.50
Sheets, hot-rolled, Gary	2.10	2.10	2.10	2.10
Sheets, cold-rolled, Gary	3.05	3.05	3.05	3.05
Sheets, No. 24 galv. Gary	3.50	3.50	3.50	3.50
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.60
Tin plate, per base box, Pitts.	$5.00	$5.00	$5.00	$5.00
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$34.00	$34.00	$34.00	$34.00
Slabs, Pittsburgh, Chicago	34.00	34.00	34.00	34.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	34.00
Wire rods No. 5 to ⅜-inch, Pitts.	2.00	2.00	2.00	2.00

Pig Iron

	Oct. 18, 1941	Sept. 1941	July 1941	Oct. 1940
Bessemer, del. Pittsburgh	$25.34	$25.34	$25.34	$24.34
Basic, Valley	23.50	23.50	23.50	22.50
Basic, eastern, del. Philadelphia	25.34	25.34	25.34	24.34
No. 2 fdry., del. Pgh., N.&S. Sides	24.69	24.69	24.69	23.69
No. 2 foundry, Chicago	24.00	24.00	24.00	23.00
Southern No. 2, Birmingham	20.38	20.38	20.38	19.38
Southern No. 2, del. Cincinnati	24.06	24.06	24.06	23.06
No. 2X, del. Phila. (differ. av.)	26.215	26.215	26.215	25.215
Malleable, Valley	24.00	24.00	24.00	23.00
Malleable, Chicago	24.00	24.00	24.00	23.00
Lake Sup., charcoal, del. Chicago	31.34	31.34	31.34	30.34
Gray forge, del. Pittsburgh	24.19	24.19	24.19	23.17
Ferromanganese, del. Pittsburgh	125.33	125.33	125.33	125.33

Scrap

Heavy melting steel, Pitts.	$20.00	$20.00	$20.00	$21.30
Heavy melt. steel, No. 2, E. Pa.	17.75	17.75	17.75	19.75
Heavy melting steel, Chicago	18.75	18.75	18.75	19.85
Rails for rolling, Chicago	22.25	22.25	22.25	24.05
No. 1 Cast, Chicago	20.00	21.50	21.50	17.55

Coke

Connellsville, furnace, ovens	$6.25	$6.25	$6.25	$4.75
Connellsville, foundry, ovens	7.25	7.25	7.25	5.75
Chicago, by-product fdry., del.	12.25	12.25	12.25	11.75

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. mill, carloads.

Sheets, Strip

Hot-Rolled Sheets

Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 2.10c
Granite City base 2.20c
Detroit, del. 2.20c
Pacific ports 2.65c

Cold-Rolled Sheets

Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, B'ham., base 3.05c
Granite City, base 3.15c
Detroit, del. 3.15c
Other Mich. pts., del. 2.25c
Pacific ports 3.70c

Galvanized Sheets, No. 24

Pittsburgh, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, base 3.50c
Granite City, base 3.60c
Pacific ports 4.05c

Corrugated Galv. Sheets

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Youngstown, Sparrows Point, Middletown, 29 gage, per square 3.31c
Granite City 3.38c
Pacific Ports 3.73c

Culvert Sheets

Pittsburgh, Gary, Birmingham, 16-gage, not corrugated, copper steel 3.60c, copper iron 3.90c, pure iron 3.95c.
Pittsburgh, 24-gage, zinc-coated, hot-dipped, heat-treated 4.25c.
Granite City, copper steel 3.70c, copper iron 4.00c, pure iron 4.05c.
Pacific ports, copper steel 4.25c, copper iron 4.55c, pure iron 4.60c.

Enameling Sheets

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 10 gage, base 2.75c
Granite City, base 2.85c
Pacific ports 3.40c
Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 20 gage, base 3.35c
Granite City, base 3.45c
Pacific ports 4.00c

Electrical Sheets, No. 24

	Pittsburgh Base	Pacific Ports	Granite City
Field gr.	3.20c	3.95c	3.30c
Armat.	3.55c	4.30c	3.65c
Elect.	4.05c	4.80c	4.15c
Motor	4.95c	5.70c	5.05c
Dynamo	5.65c	6.40c	5.75c
Transformer 72	6.15c	6.90c	.....
Transformer 65	7.15c	7.90c	.....
Transformer 58	7.65c	8.40c	.....
Transformer 52	8.45c	9.20c	.....

Hot-Rolled Strip

Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Middletown, base, 1 ton and over, 12 inches wide and less 2.10c
Detroit, del. 2.20c
Other Mich. pts. del. 2.25c
Pacific ports 2.75c

Cold-Rolled Strip

Pittsburgh, Cleveland, Youngstown, 0.25 carbon and less 2.80c
Chicago, base 2.90c
Worcester, base 3.00c
Detroit, del. 2.90c
Other Mich. pts. del. 2.95c

Commodity C.R. Strip

Pittsburgh, Cleveland, Youngstown, base 3 tons and over 2.95c
Worcester, base 3.35c
Detroit, del. 3.05c
Other Mich. pts. del. 3.10c

Cold-Finished Spring Steel

Pittsburgh, Cleveland, base; add 20 cents for Worcester.
.26-.50 Carbon 2.80c
.51-.75 Carbon 4.30c
.76-1.00 Carbon 6.15c
Over 1.00 Carbon 8.35c

Stainless Steels

Base, Cents per lb.—f.o.b. Pittsburgh

TYPE	BARS	PLATES	SHEETS	H. R. STRIP	C. R. STRIP
302	24.00c	27.00c	34.00c	21.50c	28.00c
303	26.00	29.00	36.00	27.00	33.00
304	25.00	29.00	36.00	23.50	30.00
304-20% clad	.....	*18.00	19.00	.....	.....
308	29.00	34.00	41.00	28.50	35.00
309	36.00	40.00	47.00	37.00	47.00
310	49.00	52.00	53.00	48.75	56.00
311	49.00	52.00	53.00	48.75	56.00
312	36.00	40.00	49.00	.....	.....
316	40.00	44.00	48.00	40.00	48.00
317	50.00	54.00	58.00	50.00	58.00
347	33.00	38.00	45.00	33.00	42.00
403	21.50	24.50	29.50	21.25	27.00
410	18.50	21.50	26.50	17.00	22.00
416	19.00	22.00	27.00	18.25	23.50
420	24.00	28.50	33.50	23.75	36.50
430	19.00	22.00	29.00	17.50	22.50
430F	19.50	22.50	29.50	18.75	24.50
431	19.00	22.00	29.00	17.50	22.50
442	22.50	25.50	32.50	24.00	32.00
446	27.50	30.50	36.50	35.00	52.00
501	8.00	12.00	15.75	12.00	17.00
502	9.00	13.00	16.75	13.00	18.00

*Includes annealing and pickling.

Tin, Terne Plate

Tin Plate

Pittsburgh, Chicago, Gary, 100-lb. base box $5.00
Granite City $5.10

Tin Mill Black Plate

Pittsburgh, Chicago, Gary, base 29 gage and lighter 3.05c
Granite City 3.15c
Pacific ports, boxed 4.05c

Long Ternes

Pittsburgh, Gary No. 24 unassorted 3.80c
Pacific Ports 4.55c

Special Coated Mfg. Ternes

Pittsburgh, Chicago, Gary, 100-base box $4.30
Granite City $4.40

Roofing Ternes

Pittsburgh base per package 112 sheets 20 x 28 in., coating I.C.

8-lb.	$12.00	25-lb.	$16.00
15-lb.	14.00	30-lb.	17.25
20-lb.	15.00	40-lb.	19.50

Steel Plate

Pittsburgh, Chicago, Gary, Cleveland, Birmingham,

Youngstown 2.10c
Coatesville, Sparrows Point, Claymont 2.10c
Gulf ports 2.45c
Pacific Coast ports 2.65c

Steel Floor Plates

Pittsburgh 3.35c
Chicago 3.35c
Gulf ports 3.70c
Pacific Coast ports 4.00c

Structural Shapes

Pittsburgh, Bethlehem, Chicago, Buffalo, Birmingham 2.10c
St. Louis, del. 2.34c
Pacific Coast ports 2.75c

Bars

Hot-Rolled Carbon Bars

Pittsburgh, Chicago, Gary, Cleve., Birm., base 20 tons one size 2.15c
Detroit, del. 2.25c
New York, del. 2.49c
Duluth, base 2.25c
Philadelphia, del. 2.47c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pac. ports, dock 2.80c
All-rail from Chicago.. 3.25c

Rail Steel Bars

Pitts., Chicago, Gary, Cleveland, Birm., base 5 tons 2.15c
Detroit, del. 2.25c
New York, del. 2.49c
Philadelphia, del. 2.47c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pac. ports, dock 2.80c
All-rail from Chicago.. 3.25c

Hot-Rolled Alloy Bars

Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size 2.70c
Detroit 2.80c

Alloy	Diff.	Alloy	Diff.
2000.....	0.35	3100.....	0.70
2100.....	0.75	3200.....	1.35
2300.....	1.70	3300.....	3.80
2500.....	2.55	3400.....	3.20

4100 .15-25 Mo. 0.55
4600 0.20-0.30 Mo.; 1.50-2.00 Ni. 1.20
5100 80-1.10 Cr. 0.45
5100 Spr. flats 0.15
6100 Bars 1.20
6100 Spr. flats 0.85
Carb., Van. 0.85
9200 Spr. flats 0.15
9200 Spr. rounds, squares 0.40
T 1300, Mn, mean 1.51-2.00 0.10
Do., carbon under 0.20 max. 0.35

Cold-Finished Carbon Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lbs. 2.65c
Detroit 2.70c

Cold-Finished Alloy Bars

Pitts., Chicago, Gary, Cleveland, Buffalo, base 3.35c
Detroit 3.45c
Galveston, add $0.25; Pacific Coast, $0.50.

Turned, Ground Shafting

Pitts., Chicago, Gary, Cleveland, Buffalo, base (not including turning, grinding, polishing extras) 2.65c
Detroit 2.70c

Reinforcing Bars (*New Billet*)

Pitts., Chicago, Gary, Cleveland, Birm., Sparrows Point, Buffalo, Youngstown, base 2.15c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pacific ports, dock 2.80c
Detroit, del. 2.25c

Reinforcing Bars (*Rail Steel*)

Pitts., Chicago, Gary, Cleveland, Birm., base. 2.15c
Gulf ports, dock 2.50c
All-rail, Houston from Birmingham 2.59c
Pacific ports, dock 2.80c
Detroit, del. 2.25c

Iron Bars

Philadelphia, com. del. 3.06-3.50c
Pittsburgh, muck bar ... 5.00c
Pittsburgh, staybolt 8.00c
Terre Haute com., f.o.b. mill 2.15c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard and cement coated wire nails $2.55

(Per Pound)

Polished fence staples .. 2.55c
Annealed fence wire 3.05c
Galv. fence wire 3.40c
Woven wire fencing (base C. L. column) 67
Single loop bale ties, (base C. L. column) .. 59
Galv. barbed wire, 80-rod spools, base column .. 70
Twisted barbless wire, column 70

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago Birmingham (except spring wire at Birmingham)

Bright bess., basic wire. 2.60c
Galvanized wire 2.60c
Spring wire 3.20c
Worcester, Mass., 10c higher on bright basic and spring wire.

Cut Nails

Carload, Pittsburgh, keg. $3.85

Alloy Plates (Hot)

Pitts., Chicago, Coatesville, Pa. 3.50c

Rails, Fastenings

(Gross Tons)

Standard rails, mill $40.00
Relay rails, Pittsburgh 20—100 lbs. 32.50-35.50
Light rails, billet qual., Pitts., Chicago, Bham. $40.00
Do., rerolling quality.. 39.00

Cents per pound

Angle bars, billet, mills. 2.70c
Do., axle steel 2.35c
Spikes, R. R. base 3.00c
Track bolts, base 4.75c
Do., heat treated 5.00c
Car axles forged, Pitts., Chicago, Birmingham.. 3.15c
Tie plates, base 2.15c

Base, light rails 25 to 60 lbs., 20 lbs., up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham, Chicago. Discounts for carloads additional 5%, full containers, add 10%.

Carriage and Machine

½ x 6 and smaller.....65½ off
Do., ⅝ and ⅝ x 6-in. and shorter .....63½ off
Do., ¾ to 1 x 6-in. and shorter .....61 off
1⅛ and larger, all lengths 59 off
All diameters, over 6-in. long .....59 off
Tire bolts .....50 off

Stove Bolts

In packages with nuts separate 71-10 off; with nuts attached 71 off; bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-in.

Step bolts .....56 off
Plow bolts .....65 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
½-inch and less.	62	64
⅝-1-inch	59	60
1⅛-1½-inch	57	58
1⅝ and larger..	56	.

Hexagon Cap Screws

Upset 1-in., smaller .....60 off

Square Head Set Screws

Upset, 1-in., smaller ....68 off
Headless, ¼-in., larger ..55 off
No. 10, smaller .....60 off

Piling

Pitts., Chgo., Buffalo .. 2.40c

Rivets, Washers

F.o.b. Pitts., Cleve., Chgo., Bham.

Structural 3.75c
⅞-inch and under .....65-5 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. .....$4.00 off

Tool Steels

Pittsburgh, Bethlehem, Syracuse, base, cents per lb.

Carb. Reg. 14.00 Oil-hardening .. 24.00
Carb. Ext. 18.00
Carb. Spec. 22.00 High car.-chr. 43.00

High Speed Tool Steels

Tung.	Chr.	Van.	Moly.	
18.00	4	1	...	67.00
18.00	4	2	1	77.00
18.00	4	3	1	87.00
1.50	4	1	8.50	54.00
....	4	2	8	54.00
5.50	4	1.50	4	57.50
5.50	4.50	4	4.50	70.00

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut-lengths 4 to 24 feet; f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½"O.D.	13	$ 9.72	$23.71
1¾"O.D.	13	11.06	22.93
2" O.D.	13	12.38	19.35
2¼"O.D.	13	13.79	21.68
2¼"O.D.	12	15.16	....
2½"O.D.	12	16.58	26.57
2¾"O.D.	12	17.54	29.00
3" O.D.	12	18.35	31.36
3½"O.D.	11	23.15	39.81
4" O.D.	10	28.66	49.90
5" O.D.	9	44.25	73.93
6" O.D.	7	68.14	....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O.D.	13	$ 7.82	$ 9.01
1¼"O.D.	13	9.26	10.67
1½"O.D.	13	10.23	11.79
1¾"O.D.	13	11.64	13.42
2" O.D.	13	13.04	15.03
2¼"O.D.	13	14.54	16.76
2¼"O.D.	12	16.01	18.45
2½"O.D.	12	17.54	20.21
2¾"O.D.	12	18.59	21.42
3" O.D.	12	19.50	22.48
3½"O.D.	11	24.62	28.37
4" O.D.	10	30.54	35.20
4½"O.D.	10	37.35	43.04
5" O.D.	9	46.87	54.01
6" O.D.	7	71.96	82.93

Welded Iron, Steel, Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less on lap weld, 1 point less on butt weld. Chicago delivery 2½ and 1½ less, respectively. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	51
¾	66½	55
1—3	68½	57½

Iron

¾	30	10
1—1¼	34	16
1½	38	18½
2	37½	18

Lap Weld

Steel

2	61	49½
2½—3	64	52½
3½—6	66	54½
7 and 8	65	52½

Iron

2	30½	12
2½—3½	31½	14½
4	33½	18
4½—8	32½	17
9—12	28½	12

Line Pipe, Plain Ends

Steel

1 to 3, butt weld..... 68½
2, lap weld 63
2½ to 3, lap weld 66
3½ to 6, lap weld 65
7 and 8, lap weld 64
Seamless, 3 pts. lower discount.

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm..$45.00-46.00
4-in., Birmingham .. 48.00-49.00
4-in., Chicago 56.80-57.80
6-in. & over, Chicago 53.80-54.80
6-in. & over, east fdy. 49.00
Do., 4-in 52.00
Class A Pipe $3 over Class B
Stnd. fitgs., Birm., base $100.00.

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Cleve., Buffalo, Youngs., Birm., Sparrows Point..$34.00
Duluth (billets) 36.00
Detroit, delivered 36.00

Forging Quality Billets

Pitts., Chi., Gary, Cleve., Young., Buffalo, Birm.. 40.00
Duluth 42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago. 34.00
Detroit, delivered 36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl. (per 100 lbs.) $2.00
Do., over ⅜ to 47/64-in. incl. 2.15
Worcester up $0.10, Galveston up $0.25 and Pacific Coast up $0.50 on water shipments.

Skelp

Pitts., Chi., Youngstown, Coatesville, Sparrows Pt. 1.90c

Shell Steel

Pittsburgh, Chicago, base, 1000 tons of one size, open hearth

3-12-inch $52.00
12-18-inch 54.00
18-inch and over 56.00

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur... $6.00- 6.25
Connellsville, fdry.. 7.00- 7.50
Connell. prem. fdry. 7.25- 7.60
New River fdry. .. 8.00- 8.25
Wise county fdry. .. 7.50
Wise county fur. .. 6.50

By-Product Foundry

Newark, N. J., del... 12.60-13.05
Chicago, outside del. 11.50
Chicago, delivered .. 12.25
Terre Haute, del. .. 12.00
Milwaukee, ovens... 12.25
New England, del. .. 13.75
St. Louis, del. 12.02
Birmingham, ovens. 8.50
Indianapolis, del. .. 12.00
Cincinnati, del. 11.75
Cleveland, del. 12.30
Buffalo, del. 12.50
Detroit, del. 12.25
Philadelphia, del. .. 12.38

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol.... 14.00c
Toluol, two degree 27.00c
Solvent naphtha 26.00c
Industrial xylol 26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (less than 1000 lbs.) 14.25c
Do. (1000 lbs. or over) 13.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers 7.00c

Per ton, bulk, f.o.b. port

Sulphate of ammonia $30.00

Pig Iron

No. 2 foundry is 1.75-2.25 sil.; 50c diff. for each 0.25 sil. above 2.25 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$24.50	$26.00
Birmingham, Ala.§	20.38	.....	19.38	25.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.00	25.50	24.50	26.00
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00–24.50	24.00–24.50	23.50–24.50	24.50–25.00
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00–24.50	24.00–24.50	23.50–24.50	24.50–25.00

§Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham†	25.61	.....	25.11	.....
Boston from Birmingham†	25.12	.....	.....	.....
Boston from Everett, Mass.	25.50	26.00	25.00	26.50
Boston from Buffalo	25.50	26.00	25.00	26.50
Brooklyn, N. Y., from Bethlehem	27.50	28.00	.....	.....
Canton, O. from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	†24.22	.....	.....	.....
Cincinnati from Hamilton, O.	24.44	25.11	24.61	.....
Cincinnati from Birmingham†	24.06	.....	23.06	.....
Cleveland from Birmingham†	24.12	.....	23.12	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	.....
Milwaukee from Chicago	25.10	25.10	24.60	25.60
Muskegon, Mich., from Chicago, Toledo or Detroit	27.19	27.19	.....	.....
Newark, N. J., from Birmingham†	26.15	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham†	25.46	.....	24.96	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....

Pittsburgh dist.: Add to Neville Island base, North and South Sides, 69c; McKees Rocks, 55c; Lawrenceville, Homestead, McKeesport, Ambridge, Monaca, Aliquippa, 84c; Monessen, Monongahela City, $1.07; Oakmont, Verona, $1.11; Brackenridge, $1.24.

	No. 2 Fdry.	Malleable	Basic	Bessemer
Saginaw, Mich., from Detroit	26.31	26.31	25.81	26.81
St. Louis, northern	24.50	24.50	24.00	.....
St. Louis from Birmingham	†24.50	.....	23.62	.....
St. Paul from Duluth	26.63	26.63	.....	27.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Buffalo, N. Y., $29.50, base; $30.74 delivered Philadelphia.

Gray Forge		Charcoal	
Valley furnace	$23.50	Lake Superior fur.	$28.00
Pitts. dist. fur.	23.50	do., del. Chicago	31.34
		Lyles, Tenn., high phos.	28.50

Silvery

Jackson county, O., base, 6.00 to 6.50 per cent $29.50. Add 50 cents for each additional 0.25 per cent of silicon. Buffalo base $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base; Prices are the same as for silveries, plus $1 a ton.

Manganese differentials in silvery iron and ferrosilicon not to exceed 50 cents per 0.50 per cent manganese in excess of 1 per cent.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$64.60

First Quality

Pa., Ill., Md., Mo., Ky.	51.30
Alabama, Georgia	51.30
New Jersey	56.00

Second Quality

Pa., Ill., Ky., Md., Mo.	46.55
Georgia, Alabama	38.00
New Jersey	49.00

Ohio

First quality	43.00
Intermediate	36.10
Second quality	36.00

Malleable Bung Brick

All bases	$59.85

Silica Brick

Pennsylvania	$51.30
Joliet, E. Chicago	58.90
Birmingham, Ala.	51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$31.00
Wire cut	29.00

Magnesite

Domestic dead-burned grains, net ton f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$54.00
Chem. bonded chrome	54.00
Magnesite brick	76.00
Chem. bonded magnesite	65.00

Fluorspar

Washed gravel, duty pd., tide. net ton	nominal
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail	$23.00
Do., barge	23.00
No. 2 lump	23.00

Ferroalloy Prices

Ferromanganese, 78-82%, Carlots, duty paid, sbd. $120.00
Carlots, del. Pitts. 125.33
Carlots, f.o.b. Southern furn. 145.00
For ton lots add $10, for less-than-ton lots $13.50, for less than 200-lb. lots $18.

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 36.00

Ferrosilicon, 50%, freight allowed, c.l. 74.50
Do., ton lot 87.00
Do., 75 per cent 135.00
Do., ton lots 151.00
Spot, $5 a ton higher.

Silicomanganese, c.l., 2½ per cent carbon 118.00
1½% carbon 128.00
Contract ton price $12.50 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.90-2.00

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80-2.90

Ferrophosphorus, gr. ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electric furn., per ton, c.l., 23-26% f.o.b. Mt. Pleasant, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., contained cr., del. carlots 13.00c
Do., ton lots 13.75c
Do., less-ton lots 14.00c
less than 200 lb. lots. 14.25c

67-72% low carbon:

	Carloads	Ton lots	Less ton
2% carb.	19.50c	20.25c	20.75c
1% carb.	20.50c	21.25c	21.75c
0.10% carb.	22.50c	23.25c	23.75c
0.20% carb.	21.50c	22.25c	22.75c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Molybdenum Oxide, lb. Molyb. cont., 5-20-lb. containers, f. o. b., Washington, Pa., and Langeloth, Pa., lb. 0.80

Ferrotitanium, 40-45%, lb., con. ti., f.o.b. Niagara Falls, ton lots. $1.23
Do., less-ton lots 1.25
20-25% lb., con. ti., 0.10 C. max., ton lots, lb. 1.35
Do., less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-60% contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do., less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do., spot 145.00
Do., contract, ton lots 145.00
Do., spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do., spot 160.00
Do., contract, ton lots. 160.00
Do., spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do., ton lots 8.00c
Do., less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract, freight allowed, lb. carlots, bulk 8.25c
Do., ton lots 8.75c
Do., less-ton lots 9.00c
Do., less 200 lbs. 9.25c
Spot ¼c lb. higher

Tungsten Metal Powder, 98-99 per cent, per lb., depending upon quantity $2.60-2.70

Vanadium Pentoxide, contract, lb. contained $1.10
Do., spot 1.15

Chromium Metal, 98% cr., contract, lb. con. chrome, ton lots 80.00c
Do., spot 85.00c
88% chrome, cont. tons. 79.00c
Do., spot 84.00c

Silicon Metal, 1% iron, contract carlots, 2 x ⅛-in., lb. 14.50c
Do., 2% 13.00c
Spot ¼c higher

Silicon Briquets, contract carloads, bulk, freight allowed, ton $74.50
Ton lots 84.50
Less-ton lots, lb. 4.00c
Less 200 lb. lots, lb. 4.25c
Spot ¼-cent higher

Manganese Briquets, contract carloads, bulk freight allowed, lb. 5.50c
Ton lots 6.00c
Less-ton lots 6.25c
Spot ¼c higher

Zirconium Alloy, 12-15%, contract, carloads, bulk, gross ton 102.50
Do., ton 108.00
35-40%, contract, carloads, lb., alloy 14.00c
Do., ton lots 15.00c
Do., less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do., 100-200 lb. lots 2.75
Do., under 100-lb. lots 3.00

Molybdenum Oxide Briquets, 48-52% molybdenum, per pound contained, f.o.b. producers' plant 80.00c

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24	Cold Rolled Strip	Cold Drawn Bars: Carbon	Cold Drawn Bars: S.A.E. 2300	Cold Drawn Bars: S.A.E. 3100
Boston	3.98	4.06	5.06	3.85	3.85	5.66	3.71	4.48	5.11	3.46	4.13	8.88	7.23
New York (Met.)	3.84	3.96	3.96	3.76	3.75	5.56	3.58	4.60	5.00	3.51	4.09	8.84	7.19
Philadelphia	3.85	3.95	4.45	3.55	3.55	5.25	3.55	4.05	5.26	3.31	4.06	8.56	7.10
Baltimore	3.85	4.00	4.35	3.70	3.70	5.25	3.50	....	5.05	....	4.05	....	....
Norfolk, Va.	4.00	4.10	....	4.05	4.05	5.45	3.85	....	5.40	....	4.15	....	....
Buffalo	3.35	3.82	3.82	3.62	3.40	5.25	3.25	4.30	4.75	3.52	3.75	8.40	6.75
Pittsburgh	3.35	3.60	3.60	3.40	3.40	5.00	3.35	....	4.65	....	3.65	8.40	6.75
Cleveland	3.25	3.50	3.50	3.40	3.58	5.18	3.35	4.05	4.62	3.20	3.75	8.40	6.75
Detroit	3.43	3.43	3.68	3.60	3.65	5.27	3.43	4.30	4.84	3.40	3.80	8.70	7.05
Indianapolis	3.60	3.75	3.75	3.70	3.70	5.30	3.45	....	5.01	....	3.97	....	....
Cincinnati	3.60	3.67	3.67	3.65	3.68	5.28	3.42	4.00	4.92	3.47	4.00	8.75	7.10
Chicago	3.50	3.60	3.60	3.55	3.55	5.15	3.25	4.10	4.85	3.30	3.75	8.40	6.75
Twin Cities	3.75	3.85	3.85	3.80	3.80	5.40	3.50	4.85	5.25	3.83	4.34	9.09	7.44
Milwaukee	3.63	3.53	3.53	3.68	3.68	5.28	3.18	4.23	4.73	3.54	3.88	8.38	6.98
St. Louis	3.64	3.74	3.74	3.69	3.69	5.29	3.39	4.24	4.99	3.61	4.02	8.77	7.12
Kansas City	4.05	4.15	4.15	4.00	4.00	5.60	3.90	....	5.00	....	4.30	....	....
Omaha	4.10	4.20	4.20	4.15	4.15	5.75	3.85	5.32	6.00	....	4.42	....	....
Memphis	4.15	4.35	4.35	4.20	4.20	5.96	4.35	....	6.00	....	4.56	....	....
Chattanooga	3.80	4.00	4.00	3.85	3.85	5.80	3.75	....	4.50	....	4.39	....	....
Tulsa, Okla.	4.44	4.34	4.34	4.49	4.49	6.09	4.19	....	5.79	....	4.69	....	....
Birmingham	3.50	3.70	3.70	3.55	3.55	5.93	3.45	....	4.75	....	4.43	....	....
New Orleans	4.00	4.10	4.10	3.80	3.80	5.75	3.85	....	4.80	5.00	4.60	....	....
Houston, Tex.	3.75	5.95	5.95	4.10	4.10	5.50	4.20	....	5.25	....	7.15	....	....
Seattle	4.00	4.00	5.20	4.75	4.75	6.50	4.75	7.25	6.00	....	5.75	....	....
Portland, Oreg.	4.25	4.50	6.10	4.00	4.00	5.75	3.95	6.50	5.00	....	5.75	....	....
Los Angeles	4.15	5.45	7.25	4.95	4.95	7.20	5.10	7.30	6.30	....	6.60	11.35	10.35
San Francisco	4.00	5.20	6.80	4.70	4.70	6.40	4.70	7.20	6.45	....	7.05	11.60	10.60

	S.A.E. Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series
Boston	4.28	7.75	6.05	5.80	7.90
New York (Met.)	4.04	7.60	5.90	5.65	....
Philadelphia	4.10	7.56	5.86	5.61	8.56
Baltimore	4.45	....	....	....	....
Norfolk, Va.	....	....	....	....	....
Buffalo	3.55	7.35	5.65	5.40	7.50
Pittsburgh	3.40	7.45	5.75	5.50	7.60
Cleveland	3.30	7.55	5.85	5.85	7.70
Detroit	3.48	7.67	5.97	5.72	7.19
Cincinnati	3.65	7.69	5.99	5.74	7.84
Chicago	3.70	7.35	5.65	5.40	7.50
Twin Cities	3.95	7.70	6.00	6.09	8.19
Milwaukee	3.83	7.33	5.88	5.63	7.73
St. Louis	3.84	7.72	6.02	5.77	7.87
Seattle	6.45	....	8.75	8.60	9.40
Portland, Oreg.	5.70	8.85	8.00	7.85	8.65
Los Angeles	4.80	9.55	8.55	8.40	9.05
San Francisco	6.05	10.60	9.60	9.45	10.10

BASE QUANTITIES

Soft Bars, Bands, Hoops, Plates, Shapes, Floor Plates, Hot Rolled Sheets and SAE 1035-1050 Bars: Base, 400-1999 pounds; 300-1999 pounds in Los Angeles; 400-39,999 (hoops, 0-299) in San Francisco; 300 pounds and over, Portland, Seattle; 400-14,999 Twin Cities; 400-3999 Birmingham; 400 pounds and over in Memphis; Los Angeles, bars over 4-in. wide, 1-in. thick, 4.95c.

Cold Rolled Sheets: Base, 400-1499 pounds in Chicago, Cincinnati, Cleveland, Detroit, New York, Omaha, Kansas City, St. Louis; 450-3749 in Boston; 500-1499 in Buffalo; 1000-1999 in Philadelphia, Baltimore; 750-4999 in San Francisco; 300-4999 in Portland, Seattle; any quantity in Twin Cities; 300-1999 Los Angeles.

Galvanized Sheets: Base, 150-1499 pounds, New York; 150-1499 in Cleveland, Pittsburgh, Baltimore, Norfolk; 1 to 10 bun. in Los Angeles; 300 and over in Portland, Seattle; 450-3749 in Boston; 500-1499 in Birmingham, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Milwaukee, Omaha, St. Louis ,Tulsa; 3500 and over in Chattanooga; any quantity in Twin Cities; 750-1500 in Kansas City; 150 and over in Memphis; any quantity in Philadelphia; 750-4999 in San Francisco.

Cold Rolled Strip: No base quantity; extras apply on lots of all size.

Cold Finished Bars: Base, 1500 pounds and over on carbon, except 0-299 in San Francisco, 1000 and over in Portland, Seattle, 1 to 99 pounds in Los Angeles; 1000 pounds and over on alloy, except 0-4999 in San Francisco.

SAE Hot Rolled Alloy Bars: Base, 1000 pounds and over, except 0-4999, San Francisco; 0-1999, Portland, Seattle.

EUROPEAN IRON, STEEL PRICES

Dollars at $4.02½ per Pound Sterling

Export Prices f.o.b. Port of Dispatch—

By Cable or Radio

	BRITISH Gross Tons f.o.b. U.K. Ports	£ s d
Merchant bars, 3-inch and over	$66.50	16 10 0
Merchant bars, small, under 3-inch, re-rolled	3.60c	20 0 0
Structural shapes	2.95c	15 10 0
Ship plates	2.90c	16 2 6
Boiler plates	3.17c	17 12 6
Sheets, black, 24 gage	4.00c	22 5 0
Sheets, galvanized, corrugated, 24 gage	4.61c	25 12 6
Tin plate, base box, 20 x 14, 108 pounds	$ 6.20	1 10 9

British ferromanganese $120.00 delivered Atlantic seaboard duty-paid.

Domestic Prices Delivered at Works or Furnace—

	£ s d
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$25.79 6 8 0(a)
Basic pig iron	24.28 6 0 6(a)
Furnace coke, f.o.t. ovens	7.40 1 16 9
Billets, basic soft, 100-ton lots and over	49.37 12 5 0
Standard rails, 60 lbs. per yard, 500-ton lots & over	2.61c 14 10 6
Merchant bars, rounds and squares, under 3-inch	3.17c 17 12 0††
Shapes	2.77c 15 8 0††
Ship plates	2.91c 16 3 0††
Boiler plates	3.06c 17 0 6††
Sheets, black, 24 gage, 4-ton lots and over	4.10c 22 15 0
Sheets, galvanized 24 gage, corrugated, 4-ton lots & over	4.70c 26 2 6
Plain wire, mild drawn, catch weight coils, 2-ton lots and over	4.28c 23 15 0
Bands and strips, hot-rolled	3.30c 18 7 0

(a) del. Middlesbrough 5s rebate to approved customers. ††Rebate 15s on certain conditions.

Ores

Lake Superior Iron Ore

Gross ton, 51½%

Lower Lake Ports

Old range bessemer	$4.75
Mesabi nonbessemer	4.45
High phosphorus	4.35
Mesabi bessemer	4.60
Old range nonbessemer	4.60

Eastern Local Ore

Cents. unit, del. E. Pa.

Foundry and basic 56-63%, contract.	12.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Manganiferous ore, 45-55% Fe., 6-10% Mang.	Nom.
N. African low phos.	Nom.
Spanish, No. African basic, 50 to 60%	Nom.
Chinese wolframite, net ton, duty pd.	$24.50-25.00
Brazil iron ore, 68-69%, ord.	7.50c
Low phos. (.02 max.)	8.00c

F.O.B. Rio Janeiro.

Scheelite, imp.	23.50-24.00
Chrome ore, Indian, 48% gross ton	.....

Manganese Ore

Including war risk but not duty, cents per unit cargo lots

Caucasian, 50-52%	.....
So. African, 50%	68.00-70.00
Indian, 50%	68.00-70.00
Brazilian, 46%	68.00-70.00
Chilean, 47%	68.00-70.00
Cuban, 50-51%, duty free	.....

Molybdenum

Sulphide conc., lb., Mo. cont., mines	$0.75

MAXIMUM PRICES FIXED BY OPA ON IRON AND STEEL SCRAP

Other than railroad grades quoted on the basis of basing point prices from which shipping point prices and consumers' delivered prices are to be computed. Scrap originating from railroads quoted delivered to consumers' plants located on the line of the railroad from which the material originated. All prices in gross tons. A basing point includes its switching district.

OTHER THAN RAILROAD GRADES (a) (b)	Pittsburgh, *Wheeling *Johnstown, Weirton, Steubenville	Youngstown, *Warren, Canton, Sharon	Chicago	Kokomo, Ind.	Bethlehem	*East. Pa.	Sparrows Pt.	Cleveland	Buffalo	Cincinnati Ashland, Ky. Portsmouth, O. Middletown, O.	St. Louis	Detroit	Duluth	Birmingham	Alabama City, Atlanta	*Pacific Coast	Minnequa, Colo.
No. 1 heavy melting	$20.00	$20.00	$18.75	$18.25	$18.25	$18.75	$18.75	$19.50	$19.25	$19.50	$17.50	$17.85	$18.00	$17.00	$17.00(d)	$14.50	$16.50
No. 1 hyd. comp. black sheets	20.00	20.00	18.75	18.25	18.25	18.75	18.75	19.50	19.25	19.50	17.50	17.85	18.00	17.00	17.00(d)	14.50	16.50
No. 2 heavy melting	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.50	18.25	18.50	16.50	16.85	17.00	16.00	16.00(d)	13.50	15.50
Dealer No. 1 bundles	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.50	18.25	18.50	16.50	16.85	17.00	16.00	16.00(d)	13.50	15.50
Dealer No. 2 bundles	18.00	18.00	16.75	16.25	16.25	16.75	16.75	17.50	17.25	17.50	15.50	15.85	16.00	15.00	15.00(d)	12.50	14.50
Mixed borings and turnings	15.25	15.25	14.00	14.25	13.50	14.00	14.00	14.75	14.50	14.75	12.75	13.10	.....	12.25	12.25	9.75	11.75
Machine shop turnings	15.50	15.50	14.25	14.50	13.75	14.25	14.25	15.00	14.75	15.00	13.00	13.35	15.50	15.00	15.00	10.00	12.00
Shovel turnings	16.50	16.50	15.25	15.50	14.75	15.25	15.25	16.00	15.75	16.00	14.00	14.35	16.50	16.00	16.00	11.00	13.00
No. 1 busheling	19.50	19.50	18.25	17.75	17.75	18.25	18.25	19.00	18.75	19.00	17.00	17.35	17.50	16.50	16.50	14.00	16.00
No. 2 busheling	15.50	15.50	14.25	13.75	13.75	14.25	14.25	15.00	14.75	15.00	13.00	13.35	13.50	12.50	12.50	10.00	12.00
Cast iron borings	15.75	15.75	14.50	14.00	14.00	14.50	14.50	15.25	15.00	†15.25	13.25	13.60	13.75	12.75	12.75	10.25	12.25
Uncut structurals and plate	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.50	18.25	18.50	18.50	16.85	17.00	16.00	16.00	13.50	15.50
No. 1 cupola	21.00	21.00	20.00	20.00	22.50	23.00	22.00	22.00	20.00	21.00	20.00	20.35	19.00	20.00	.....	18.00	.....
Heavy breakable cast	19.50	19.50	18.50	18.50	21.00	21.50	21.00	20.50	18.50	19.50	18.50	18.85	17.50	18.50	.....	17.00	.....
Stove plate	19.00	.....	17.00	16.00	18.00	18.50	18.00	18.00	19.00	17.50	17.00	14.10	16.00	17.00	.....	14.00	.....
Low phos. billet, bloom crops	25.00	25.00	23.75	23.75	23.25	23.75	23.75	24.50	24.25	23.50	22.50	22.85	23.00	22.00	.....	19.50	.....
Low phos. bar crops and smaller	23.00	23.00	21.75	21.75	21.25	21.75	21.75	22.50	22.25	21.50	20.50	20.85	21.00	20.00	.....	19.50	.....
Low phos. punch., plate scrap**	23.00(c)	23.00	21.75	21.75	21.25	21.75	21.75	22.50	22.25	21.50	20.50	20.85	21.00	20.00	.....	17.50	.....
Machinery cast cupola size***	22.00	22.00	21.00	21.00	23.50	24.00	23.50	23.00	21.00	22.00	21.00	21.35	20.00	21.00	.....	19.00	.....
No. 1 machine cast, drop broken, 150 pounds and under	22.50	22.50	21.50	21.50	24.00	24.50	24.00	23.50	21.50	22.50	21.50	21.85	20.50	21.50	.....	19.50	.....
Clean auto cast	22.50	22.50	21.50	21.50	24.00	24.50	24.00	23.50	21.50	22.50	21.50	21.85	20.50	21.50	.....	19.50	.....
Punchings and plate scrap†‡	22.00(c)	22.00	20.75	20.75	20.25	20.75	20.75	21.50	21.25	20.50	19.50	19.85	20.00	19.00	.....	16.50	.....
Punchings and plate scrap‡§	21.00(c)	21.00	19.75	19.75	19.25	19.75	19.75	20.50	20.25	19.50	18.50	18.85	19.00	18.00	.....	15.50	.....
Heavy axle and forge turnings	19.50(c)	19.50	18.25	18.25	17.75	18.25	18.25	19.00	18.75	18.00	17.00	17.35	17.50	16.50	.....	14.00	.....
Medium heavy elec. furnace turnings	18.00(c)	18.00	16.75	16.75	16.25	16.75	16.75	17.50	17.25	16.50	15.50	15.85	16.00	15.00	.....	12.50	.....
GRADES ORIGINATING FROM RAILROADS															Kansas City		
No. 1 R.R. heavy melting steel	21.00	21.00	19.75	19.25	.....	19.75	19.75	20.50	20.25	20.50	18.50	18.85	19.00	18.00	17.00	15.50	.....
Scrap rails	22.00	22.00	20.75	20.25	.....	20.75	20.75	21.50	21.25	21.50	19.50	19.85	20.00	19.00	18.00	16.50	.....
††Rerolling quality rails	23.50	23.50	22.25	21.75	.....	22.25	22.25	23.00	22.75	23.00	21.00	21.35	21.50	20.50	19.50	18.00	.....
Scrap rails 3 feet and under	24.00	24.00	22.75	22.25	.....	22.75	22.75	23.50	23.25	23.50	21.50	21.85	22.00	21.00	20.00	18.50	.....
Scrap rails 2 feet and under	24.25	24.25	23.00	22.50	.....	23.00	23.00	23.75	23.50	23.75	21.75	22.10	22.25	21.25	20.25	18.75	.....
Scrap rails 18 inches and under	24.50	24.50	23.25	22.75	.....	23.25	23.25	24.00	23.75	24.00	22.00	22.35	22.50	21.50	20.50	19.00	.....

*Johnstown, Pa., and Warren, O., are not bases for railroad grades; Wheeling railroad only. Eastern Pa. includes Coatesville, Claymont, Conshohocken, Phoenixville and Harrisburg as bases only for "other than railroad grades"; Philadelphia and Wilmington are bases only for railroad grades. Pacific Coast bases are Los Angeles, San Francisco, Seattle, Portland. †Base price at Portsmouth; Middletown 25 cents less and Ashland, Ky; ††The term 'rails for rerolling' includes any rails which are sold to be used for rerolling, irrespective of whether or not such rails are usable for re-laying. **⅜-inch and heavier, cut 12 inches and under; ***may include clean agricultural cast; ‡‡under ⅜-inch to ¼-inch, cut 12 inches and under; §§under ¼-inch to No. 12 gage, cut 12 inches and under. (c) add $1.75 at Pittsburgh. (d) Bases at Atlanta only.

OTHER BASE PRICES: Machine shop turnings $17.60, Alloy, W. Va., $13.35 Toledo, O.; **Shoveling turnings,** $14.35 Toledo; **cast iron borings,** $13.60 Toledo; **No. 1 cupola cast,** $19 Minneapolis and St. Paul, $20.50 Chattanooga, $21 Radford, Va. and $22 Phillipsdale, Bridgeport and Worcester; **Heavy breakable cast,** $20.50 Phillipsdale, Bridgeport and Worcester, $17.50 Minneapolis and St. Paul; **Stove plate** $16 Minneapolis and St. Paul, $17.50 Chattanooga, $18 Radford, Va., $15.60 Toledo and $17.50 Phillipsdale, Bridgeport and Worcester; **Machinery cast cupola size** $21.50 Chattanooga, $22 Radford, Va. and $23 Phillipsdale, Bridgeport and Worcester; **No. 1 machinery cast, drop broken** $22 Chattanooga, $22.50 Radford, Va. and $23.50 Phillipsdale, Bridgeport and Worcester; **Clean auto cast** $22 Chattanooga, $22.50 Radford, Va. and $23.50 Phillipsdale, Bridgeport and Worcester.

(a) The grades specified are, except dealers' No. 1 and No. 2 bundles and uncut structural and plate scrap, as named and defined in the simplified recommendations R-58-36 of the Department of Commerce which shall be the governing specifications for iron and steel scrap hereunder (other than railroad grades). Dealers' No. 1 bundles shall consist of new, clean black sheet scrap, hydraulically compressed in the dealer's yard. Dealers' No. 2 bundles shall consist of old fender and body scrap, and shall in no case command a premium. (b) These grades (other than railroad grades) represent the major classifications of iron and steel scrap. The maximum prices of superior or inferior grades shall continue to bear the same comparable relationship to those major grade classifications as heretofore existed between the prices of such superior or inferior grades and the prices of the major grades.

Maximum price at shipping point: A shipping point is the point from which the scrap is to be shipped to a consumer. Maximum price at which a grade of scrap may be sold f.o.b. its point of shipment is the shipping point of such scrap. **For shipping points located within a basing point,** the shipping point price is determined by taking the basing point price and deducting actual transportation costs to the consumer's plant within the basing point. **For shipping points outside a basing point,** the shipping point price is determined by taking the nearest basing point and subtracting the lowest transportation charge. (Example: No. 1 steel shipped from Toledo takes the Detroit base of $17.85 minus transportation of $1.52 or $16.33. This shipping point price is the same to all consumers wherever located.) **Exceptions:** Shipping point of any grade not listed as having a basing point in New England is the Johnstown base although nearer to Buffalo in terms of barge transportation.

Maximum prices to consumers: Maximum price at which any grade (other than railroad) may be delivered to a consumer wherever located is the shipping point price plus actual transportation charges. Where shipment is by water, not more than 75 cents per gross ton may be included for handling charges at dock. Maximum delivered price in no case shall exceed by $1 a ton the nearest maximum base price in terms of transportation charges. (Example: The $1 excess is the so-called "springboard" arrangement. Youngstown consumers can draw on the Cleveland area for No. 1 steel scrap by taking the Cleveland base of $19.50, subtracting the Cleveland switching charge of 65 cents and adding freight to Youngstown of $2.08. The resulting delivered figure of $20.93 is within the "springboard" limit of $1 over the Youngstown base of $20.)

Billet and bloom crops originating in the Pittsburgh district may be sold within or without the district at the Pittsburgh base price plus up to, but not more than $2.50 in transportation charges. Maximum prices for **unprepared scrap** shall be $2.50 a ton less than the maximums for corresponding grade or grades of prepared scrap. **Remote scrap** is material located beyond the zone from which the railroad freight rate to Pittsburgh is $11.20 and a consumer may obtain permission from OPACS to absorb transportation charges necessary to obtain 500 tons or more.

Railroad grades: Where a railroad operates in two or more basing points, the highest base applies to consumers anywhere on the line. (Example: New York Central Railroad uses the $21 Pittsburgh base on No. 1 steel since the P. & L. E. operates there). Exception: Switching charges of 84 cents a ton must be subtracted from prices on scrap originating from railroads operating in Chicago and sold for consumption outside Chicago. Where railroad scrap is shipped to an off-the-line consumer, the highest maximum on-the-line price or the nearest basing point price, whichever is higher, applies.

Commissions: Brokers are allowed a commission up to 50 cents a ton above maximum prices to consumers, including export.

Export prices: Maximum on No. 1 heavy melting steel (other than railroad) is the domestic shipping point price plus lowest transportation charge to point of export. Maximum price to a domestic consumer on line of the originating railroad plus transportation to point of export applies on No. 1 railroad steel. Customary differentials apply on other railroad and non-railroad grades.

Sheets, Strip

Sheet & Strip Prices, Page 96

Sheetmakers find that a considerable portion of high priority material now being booked is not for immediate consumption and thus are able to supply some nondefense users. Meanwhile they are unable to book further tonnage of this kind with assurance of definite delivery. In some districts demand for sheets for defense projects is less than two months ago.

Producers are using every means to provide more sheets for warehouses, realizing this will lessen pressure on themselves as consumers are able to get their requirements from store.

Some cancellations have been received from fabricators whose production is hampered by inability to obtain other material, such as nonferrous metals, and therefore are unable to proceed with their usual lines.

The easier situation is due in some degree to severe restriction on automobiles and household appliances. Announcement of a further cut in automobile output for January promises greater decrease in sheet demand for that purpose.

Stove makers have considerable work with A-2 to A-7 ratings for various defense housing projects but this work absorbs only a small portion of capacity and demand for this industry is expected to continue low.

Plates

Plate Prices, Page 96

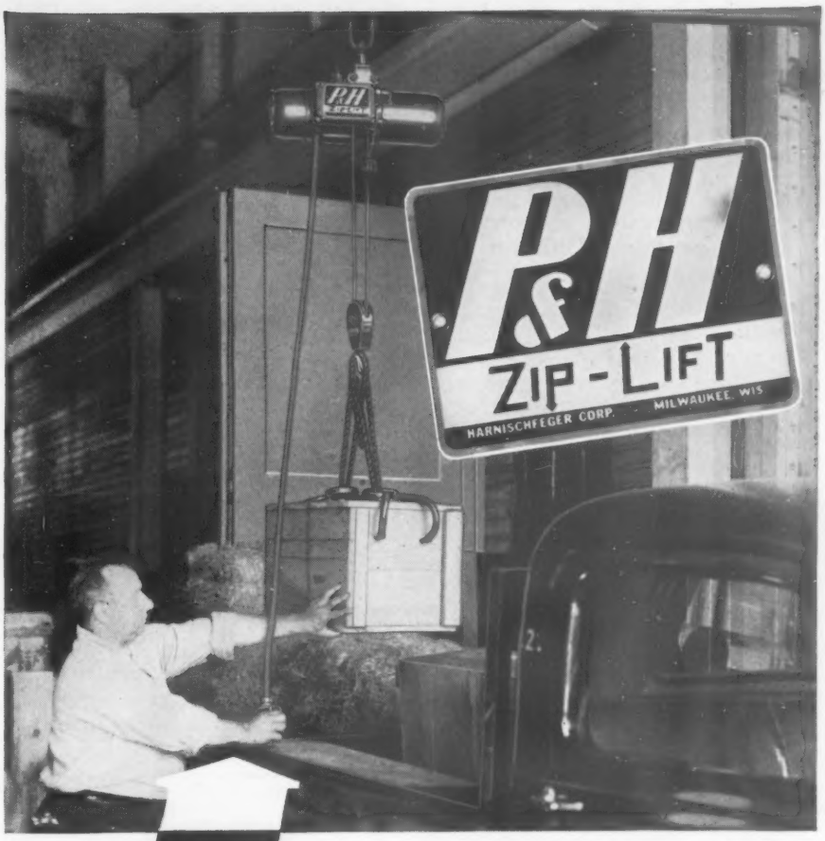
To obtain position on rolling schedules plate buyers must show A-1 priority and there is little indication of the situation becoming better for some time. Sheet mills generally are rolling light plates, leaving plate mills more leeway in handling heavier products. Auxiliary sheet mill equipment is being expanded in several plants, especially shearing and heat-treating facilities. Space for cooling beds is a problem for these producers.

Shipyards are meeting delay in some instances, deliveries being behind schedule but in others plates are being delivered more promptly than other materials. Tank builders have sufficient for their needs. Many small structural shops lack plates for bridges and water tanks, on which there is no priority. Some construction has been halted for this reason and there seems little possibility of resumption immediately.

Consumers of small tonnages have been able to pick up odd lots of mild steel plates in warehouse quantities, even in absence of priorities.

Mills in the Birmingham district are producing at capacity, shipbuilding and carbuilding needs being heavy. Recent award of additional ships to the Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., adding to the backlog.

Warehouses find it more difficult to obtain plate tonnage than any other product. This situation was



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expected but not to the extent that now develops.

With mills heavily loaded with high-priority orders much attention is being paid to dates on which the material is actually required, consumers being urged to indicate the actual degree of need in this respect. With this information mills are able to arrange schedules to best advantage.

PLATE CONTRACTS PLACED

135 tons, 250,000-gallon water tank, lighter-than-air base, South Weymouth, Mass., to Chicago Bridge & Iron Co., Chicago.

PLATE CONTRACTS PENDING

2500 tons, eight gasoline storage tanks for Porto Rico; to be awarded through McCloskey & Co., Philadelphia.

900 tons, 48-inch steel pipe line, Chattanooga, Tenn.; Stone & Webster Engineering Corp., Boston, contractor.

600 tons, acid tanks, defense plant project, Chattanooga, Tenn.; Stone & Webster Engineering Corp., Boston, contractor.

225 tons, 400,000-gallon water tank, Gunter Field, Montgomery, Ala.; bids Oct. 27, pro. 239, U. S. Engineer, Mobile, Ala.

200 tons, 24-inch steel pipe, Metropolitan District Commission, water division, Boston.

Bars

Bar Prices, Page 97

Bar producers find some difficulty in obtaining sufficient billets to meet capacity production and bar output is somewhat hampered by this lack. One factor is the tonnage of billets earmarked for shipment to Great Britain.

Only top priority can obtain a place on rolling schedules. A typical bar mill in September rolled 90 per cent on rated tonnage and 10 per cent on unrated, the latter being produced by longer runs, avoiding roll changes. This procedure adds to tonnage produced and minimizes time lost by changes.

It is thought that stricter adherence to priority may be ordered by OPM, which will reduce the tonnage for unrated purposes.

Automotive bar users are in worse position and it is doubtful if they will be able, in some cases, to attain the number of cars allowed under the reduced schedule. This is particularly true in cold-finished stock as cold-finish producers have heavy orders for shell steel, with larger tonnage expected to be allocated shortly, with A-1 ratings. At present there is scant probability of anything under A-1-f priority being delivered this year and lower ratings further deferred.

Pipe

Pipe Prices, Page 97

Considerable black pipe is going into industrial expansion and temporary lines. Resellers are checking sales relative to defense needs as protection against replacement under quota arrangement, especially in larger sizes. Wrought pipe sales are at better than seasonal rate and fourth quarter deliveries, with few exceptions, are possible only under higher ratings. About 75 per cent of current buying carries some priority rating. Stocks are irregular and resellers find various sizes difficult to replace. This is especially true of galvanized material, inquiry for which is somewhat slower.

Pig iron priority has made it difficult to build up reserves of cast iron pipe to cover spot buying. Well over half present inquiry is covered by fairly high priority.

Distributors believe they will obtain close to their quotas this quarter, although mills have capacity business on books.

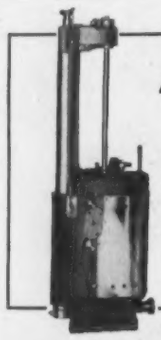
CAST PIPE PENDING

320 tons, 4 to 12-inch, air base, South Weymouth, Mass., with alternates on other types.

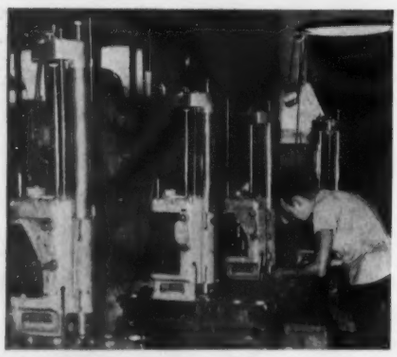
Wire

Wire Prices, Page 97

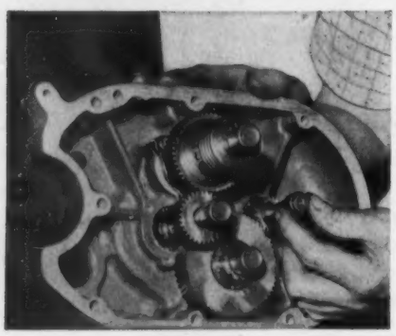
Wire orders are heavier, in some instances topping shipments and a few cancellations are welcomed by producers. The latter are mostly from the automobile trade or industries unable to secure other materials involved in fabrication of finished goods. Attempts to improve deliveries meet little success, most specialty volume making it impossible to cut corners in finishing operations. Growing scarcity of rod supplies also tends to delay deliveries, although on a few items slight improvement is noted. A growing volume of new tonnage



"30% DEEPER MACHINING"
WITH COMPACT, ANTI-FRICTION
NEEDLE BEARINGS



1. CYLINDER REBORING MACHINES, such as these, do a quick, precise job on auto engines. These advantages are achieved largely through the use of anti-friction Torrington Needle Bearings. Says the maker of this "Stormizing" equipment: "The six anti-friction Needle Bearings occupy no more space than plain bushings, yet they permit the machines to make 30% deeper cuts. And they help assure the even flow of power to cutter needed for high speed precision boring."



2. SMALL, AREN'T THEY, these high-capacity Needle Bearings on the gear shafts! Compact Needle Bearings can be easily adapted to existing housings, giving dependable anti-friction service while keeping surrounding parts small in size and light in weight. Their hardened steel construction and ample lubricant capacity eliminate the need for frequent attention and provide long bearing life. Installation is very simple, and initial costs, too, are low.

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TORRINGTON NEEDLE BEARING

carries priority ratings. Delays in classification of backlogs under form PD-73 are rather general.

Bids close Oct. 31 under schedule 9031, bureau of supplies and accounts, navy department, on 1065 tons corrosion-resisting steel welding electrodes, delivery east and west yards, the larger quantities being for Brooklyn, Philadelphia and Norfolk, Va.

Rails, Cars

Track Material Prices, Page 97

With bids going in this week on 2335 freight cars for United States Steel Corp. subsidiaries, an early improvement in domestic freight car buying is anticipated. In addition, bids will be closed soon on 225 freight cars for other Steel Corp. subsidiaries.

Meanwhile a large number of cars and locomotives are under consideration for purchase under the lease-lend program for export to the Near East and to other foreign destinations. Were it not for the acute shortage of steel plates, it appears likely that as much as 15,000 to 20,000 freight cars would be purchased. However, in view of pressure for added equipment for American railroads, it appears doubtful that anything like this number will be awarded. At the same time, 4000 23-gage cars of light and varied types have been placed within the past few days with a Pittsburgh district builder for shipment abroad under lease-lend arrangements.

Heavy rail tonnages also are under consideration by the procurement division of the Treasury Department for shipment abroad. For Iran, alone, close to 250,000 tons are under contemplation, and it is considered likely that such requirements will be met by relaying rails. It is said there is a heavy tonnage of track no longer in use in this country, which could be supplied for such emergency needs in the various theaters of war.

Chicago city council has authorized purchase of rails and roadbed accessories costing $320,990 for the State street subway, including over 4100 tons of rails and accessories. The subway project has B-1 priority. Commissioner of subways has agreement with Inland Steel Co. and Carnegie-Illinois Steel Corp. for supplying the material if the contract is placed immediately.

LOCOMOTIVES PLACED

Lone Star ordnance plant, Texarkana, Tex., one 660-horsepower diesel-electric locomotive, to American Locomotive Co., New York.

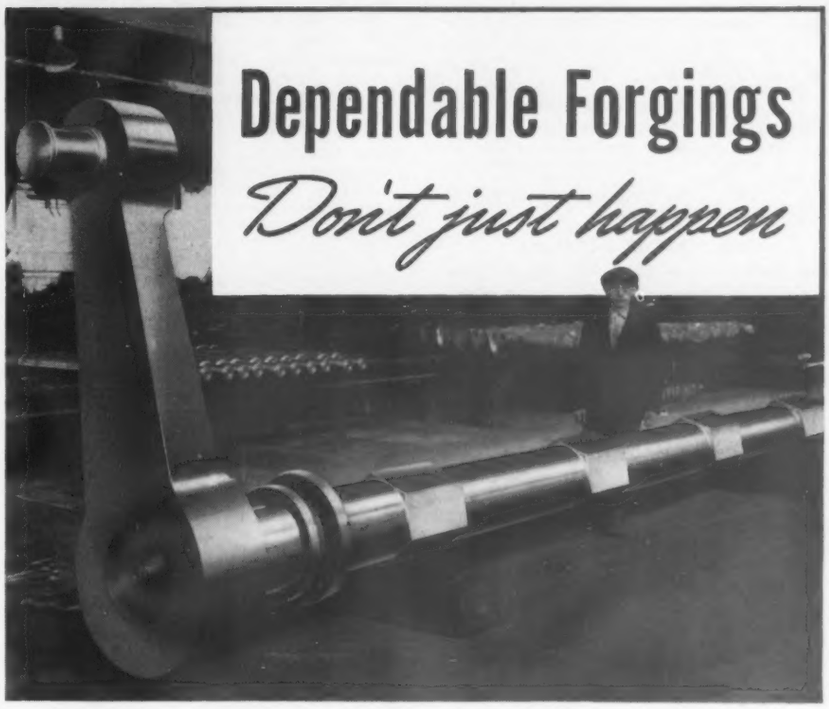
LOCOMOTIVES PENDING

Bessemer & Lake Erie, four 2-10-4 and two 0-8-0 steam locomotives; bids asked.

Missabe & Iron Range, five 2-8-8-2 locomotives; bids asked.

Navy, three diesel-electric locomotives, bids opened Oct. 17; for delivery to Hingham, Mass., Dahlgren, Va., and Burns City, Ind.

Navy, seven diesel-electric locomotives, bids to be opened Oct. 21; one for delivery to Charleston, S. C., three for Burns City, Ind., two for Fallbrook,



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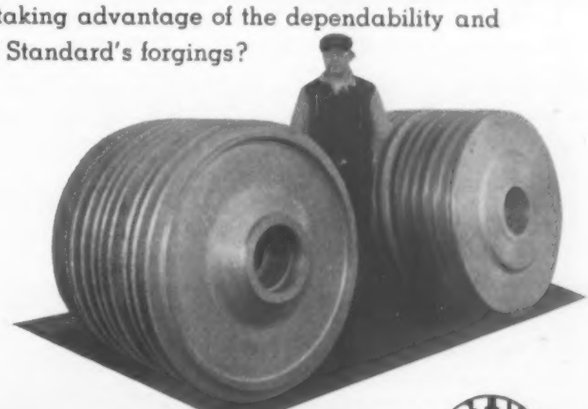
The high quality and dependability of Standard's forgings are the result of years of experience. Standard's expert engineering starts with the selection of raw materials for its own open-hearth furnaces. It embraces the supervision of every step in manufacture.

Are you taking advantage of the dependability and economy of Standard's forgings?



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Calif., and one for Hawthorn, Nev.

Ordnance plant, Parsons, Kans., and shell loading plant, Marion, Ill., each inquires for one 660-horsepower diesel-electric locomotive.

CAR ORDERS PLACED

Procurement division, Treasury department, 4000 23-gage freight cars of light miscellaneous types, placed for export, under a lease-lend arrangement, with a Pittsburgh district builder.

CAR ORDERS PENDING

American Steel & Wire Co., 65 seventy-ton gondolas and eight 50-ton air dump cars, bids asked.

Carnegie-Illinois Steel Corp., 10 fifty-ton and 10 seventy-ton air dump cars, pending.

Central of New Jersey, fifty 70-ton covered hoppers.

Michigan Limestone & Chemical Corp., 10 fifty-ton cubic yard air dump cars, pending.

National Tube Co., 10 seventy-ton hoppers, four 50-ton hoppers and three 50-ton gondolas, pending.

BUSES BOOKED

Twin Coach Co., Kent, O.: Sixty-one 40-passenger for New York City Transit System, Brooklyn, N. Y.; three 44-passenger for Surface Transportation Corp., New York; thirteen 35-passenger for Pacific Gas & Electric Co., San Francisco; fifteen 27-passenger for Wichita Transportation Corp., Wichita, Kans.; two 32-passenger for Buffalo Transit Co., Buffalo; two 33-passenger for South Suburban SafeWay Lines, Harvey, Ill.; three 27-passenger for Ohio Rapid Transit Co., Newark, O.; four 27-passenger for Peoples Transport Corp., Muskegon, Mich.

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Shaw-Box cranes are lifting a huge share of the materials and equipment and effectively speeding up all-out defense production. Speed in handling, convenience, dependability and economy are a few of the basic reasons for specifying "SHAW-BOX" cranes.

Reliable, low cost crane service depends upon modern design and proved special features that are only evolved out of the experiences of years.

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Send for catalog with complete information, illustrations, dimensions and specifications. Make us prove economy of installation by allowing us to quote on your crane requirements. SHAW-BOX CRANES themselves will prove their low operating cost and speedy, adaptable service.

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Structural Shapes

Structural Shape Prices, Page 97

With a high priority rating on by far the larger part of work now in hands of steel fabricators the recent ruling on construction will have no immediate effect on production. In some cases as high as 95 per cent of bookings carry priority. Commercial business has been small for some time and restriction on this class of work will not cause much change.

Work now on books will keep production high to the end of the year and additional priority orders are coming out in sufficient volume to carry well into next year. Until there is some recession in defense construction the loss of other work will not be appreciable.

SHAPE CONTRACTS PLACED

4000 tons, Du Pont powder plant, Choteau, Okla., to Virginia Bridge Co., Roanoke, Va.

1600 tons, power house, Potomac Electric Co., Washington, to American Bridge Co., Pittsburgh; Stone & Webster Engineering Corp., Boston, contractor.

1200 tons, state highway bridge, Carrollton, Ky., to Illinois Steel Bridge Co., Jacksonville, Ill.

1000 tons, plate girder bridge, Los Angeles, to Bethlehem Steel Co., Bethlehem, Pa.; bids Sept. 4.

600 tons, ventilation building, Lincoln tunnel, New York, to American Bridge Co., through James J. Waters Corp., New York.

332 tons, girder spans, Ullin, Ill., for Illinois Central railroad, to American Bridge Co., Pittsburgh, bids Oct. 7.

254 tons, reconstruction grade separation, Erie railroad, Greenwood Lake, Tuxedo, N. Y., to American Bridge Co., through Fred Berlanti & Son Inc., Harrison, N. Y.

250 tons, buildings and extensions, for DeLaval Separator Co., Trenton, N. J., to American Bridge Co., Pittsburgh.

200 tons, pumping stations, oil pipe line, Portland, Me.-Montreal, to Grossier & Schlager Co., Boston, taking A-1-B priority.

176 tons, state highway bridge, Erwin-Lawrenceville, N. Y., to Bethlehem Steel Co., through Howes & Farrell Inc., Oneida, N. Y.

170 tons, crane bridges, navy yard, Brooklyn, N. Y., to American Bridge Co., Pittsburgh.

170 tons, addition, Niagara Alkali Co., Niagara Falls, N. Y., to R. S. McMannus Steel Construction Co., Buffalo; 75 tons concrete bars to Reecon Co., Buffalo; Gaylord S. Guenther & Co. Inc., Niagara Falls, contractor.

155 tons, railway bridge over Baltimore & Ohio railroad, Jessup, Md., for state,

SHAPE AWARDS COMPARED

	Tons
Week ended Oct. 18	10,231
Week ended Oct. 11	23,150
Week ended Oct. 4	14,786
This week, 1940	50,930
Weekly average, 1941	28,729
Weekly average, 1940	21,326
Weekly average, Sept., 1941	31,253
Total to date, 1940	1,140,991
Total to date, 1941	1,206,627

Includes awards of 100 tons or more.

to American Bridge Co., Pittsburgh.

140 tons, housing project, Baltimore, Md., to Phoenix Bridge Co., Phoenixville, Pa.; J. Slotnick Co., Boston, contractor.

135 tons, state bridge over Androscoggin river, Errol, N. H., to American Bridge Co., Pittsburgh.

125 tons, shapes and bars, state bridge, Stowe, Vt., to Vermont Structural Steel Co., Burlington; T. J. Harvey & Son, Adams, Mass., contractor.

120 tons, signal bridges, Blue Island and Rockdale, Ill., to American Bridge Co., Pittsburgh.

104 tons, state highway bridge, Turner, Me., to Bethlehem Steel Co., Bethlehem, Pa.; Walter V. Mitten Inc., Augusta, Me., contractor; concrete bars to Bancroft & Martin Rolling Mills Co., Portland, Me.; steel contracts placed subject to priority rating.

100 tons, storehouse, naval hospital, Philadelphia, to Lehigh Structural Steel Co., Allentown, Pa.

Unstated tonnage, boiler house and additions, Fafnir Bearings Co., New Britain, Conn., to Berlin Construction Co., Berlin, Conn.; Aberthaw Construction Co., Boston, contractor.

SHAPE CONTRACTS PENDING

5500 tons, buildings, General Electric Co., Fort Wayne, Ind.; Stone & Webster Engineering Corp., Boston, contractor.

5000 tons, ordnance machine shop, Navy Yard, Brooklyn, N. Y.; John Lowrey Inc., New York, contractor.

1500 tons, crane runways, Navy Yard, Brooklyn, N. Y.

1400 tons, gun placement protection-shelters, New England coast.

1100 tons, steel sheet piling, seawall, Hampden, N. H.; taking bids; bridge in connection with project to be estimated later, approximately 1800 tons.

1010 tons, shaft framing, for Warren Foundry & Pipe Corp., Mt. Hope, N. J.

640 tons, inert materials warehouses, Benicia arsenal, Benicia, Calif., for government.

600 tons, trash racks and stop logs for Bonneville dam; bids to United States engineer, Portland, Oreg., Oct. 10.

500 tons, state bridge, Hudson river, Saratoga - Rensselaer counties, New York; bids Nov. 6, Albany, N. Y.

485 tons, power house extension, for Minnesota Power & Light Co., Duluth, Minn.

430 tons, factory building, for Mack Trucks Inc., New Brunswick, N. J.

385 tons, state bridge, Lancaster county, Pennsylvania; bids Oct. 17.

345 tons, bridge, Western and Hoyne Avenues, Chicago, for Grand Trunk Western railroad.

320 tons, Leavitt street bridge, Chicago, bids Oct. 10.

275 tons, state bridge, Chemung-Steuben counties, New York; bids Nov. 6, Albany, N. Y.

230 tons, foot bridges, Hayesville and Ranger, N. C., for Tennessee Valley Authority.

170 tons, building, for Eastern Color Print Co., Waterbury, Conn.

165 tons, boiler room, Hartford hospital, Hartford, Conn.

160 tons, machine shop, for Worthington Pump & Machinery Corp., Holyoke, Mass.

145 tons, boiler supports, for Shell Oil Corp., Wood River, Ill.

130 tons, railroad siding, for Doughnut Corp. of America, Ellicott City, Md.

125 tons, repair shop and terminal building, for Leo F. Caproni, New Haven, Conn.

115 tons, building, for Grumman Aircraft Corp., Bethpage, Long Island, N. Y.

110 tons, No. 3 open-hearth furnace, for General Steel Castings Corp., Granite City, Ill.

100 tons or more, substation materials for Bonneville project; Bethlehem Steel Co., Seattle, low at $8878.

Unstated, traveling crane for Anderson Ranch dam, Boise, Idaho; bids to Denver, Oct. 29.

Unstated, powerhouse, Fort Peck dam, Montana; bids to United States engineer, Kansas City, Mo., Nov. 21.

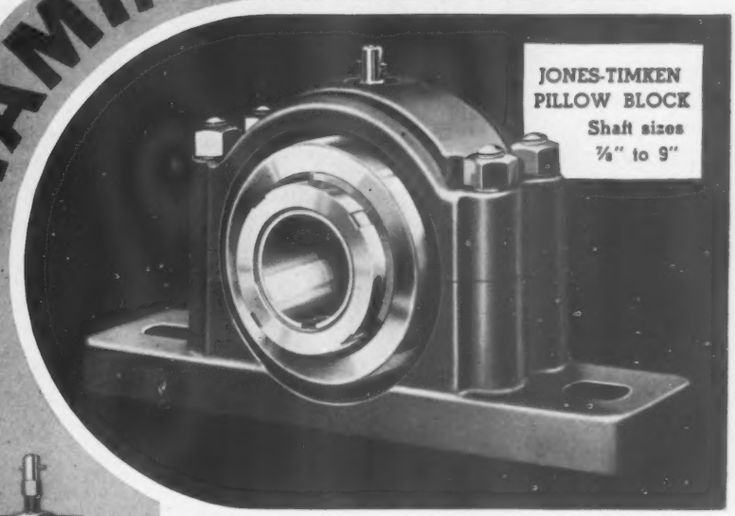
Ferroalloys

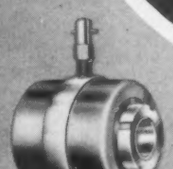
Ferroalloy Prices, Page 98

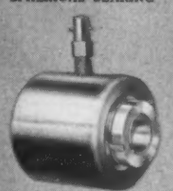
Movement in ferromanganese this month will probably show a gain over September, with the power situation in the South expected to show increasing improvement from now on. Recently there has been heavier rainfall in the South, with the season at hand when there should be still more. All of this should be reflected in greater electric power and in turn greater production. Certain other ferroalloys as well as ferromanganese should benefit, it is said.

Meanwhile prices are steady, with $120, duty paid, Atlantic and Gulf ports, still being quoted by all sellers, except one, the Tennessee producer, who several months ago was given approval by Washington to increase his price to $145, furnace. Domestic spiegeleisen, 19 to 21 per cent, is holding at $36, Palmerton, Pa.

STAMINA, INC.




SPHERICAL BEARING


CYLINDRICAL BEARING

HANGER BEARING
Shaft sizes 1⅜" to 3½"

JONES roller bearing pillow blocks and bearing units are built to solve those tough drive problems where stamina and the ability to "take it" are mighty important.

One look at these bearings will convince you that they belong to the Jones drive family. They have that sturdy look and years of maintenance records have proved how they stand up to the job.

These bearing units are practical . . . double row Timken roller bearings are locked firmly to the shaft by means of a tapered split steel adaptor and clamp nut . . . an effective seal retains lubricant and prevents the admission of dust and foreign matter . . . they are easily removed from the shaft.

The Jones organization will be pleased to give you complete details showing range of sizes built, dimensions, construction specifications and prices. Just ask for Bulletin No. 56.

W. A. JONES FOUNDRY & MACHINE CO.
4437 Roosevelt Road, Chicago, Ill.

Jones
HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS
CUT AND MOLDED TOOTH GEARS • V BELT SHEAVES
ANTI-FRICTION PILLOW BLOCKS • PULLEYS
FRICTION CLUTCHES • TRANSMISSION APPLIANCES

Reinforcing Bars

Reinforcing Bar Prices, Page 97

Practically all suppliers are interested only in jobs carrying priority and the recent regulation excluding other building from consideration has little current effect on the market. Numerous jobs on which bids have been taken are being held back from award while priority is being sought. Buying at the moment is at low ebb and little inquiry is coming out. Some shortage has developed in sizes under one inch.

REINFORCING STEEL AWARDS

3500 tons, including 3000 tons bars and 500 tons wire mesh, Midwest air depot, Oklahoma City, Okla., for war department, to Sheffield Steel Corp., Kansas City, Mo.

2500 tons, federal building, Suitland, Md., to Hudson Supply Co., Washington.

2000 tons, Lone Star ordnance plant, Texarkana, Tex., to Laclede Steel Co., St. Louis; Winston Bros., Halgen & Sons, Sollit Construction Co., St. Paul, and Missouri Valley Bridge & Iron Co., Leavenworth, Kans., contractors.

670 tons, mesh, Hartford by-pass, Hartford-Wethersfield-East Hartford, Conn., to Truscon Steel Co., Youngstown, O., $44,700; direct bids, state highway department, Hartford, Oct. 6.

550 tons, lighter-than-air base, South Weymouth, Mass., to Concrete Steel Co., Boston; Sawyer Construction Co. and V. Barletta Co., Boston, joint contractors.

530 tons, army cantonment, Neosho, Mo., to Laclede Steel Co., St. Louis; G. L. Tarlton - McDonald Engineering Co., contractors.

500 tons, Union Station addition, Washington, to American Steel Engineering Co., Philadelphia, through McCloskey & Co., Philadelphia.

200 tons, building, Hoffmann-La Roche Inc., Nutley, N. J., to Truscon Steel Co., Youngstown, O.; White Construction Co., New York, contractor.

130 tons, building, Dubuque Packing Co., Dubuque, Iowa, to Bethlehem Steel Co., Bethlehem, Pa.

113 tons, dam, U. S. Department of Agriculture, Carbondale, Ill., to Truscon Steel Co., Youngstown, O.; bids Sept. 19.

110 tons, addition, Hanson-Whitney Machine Co., Hartford, Conn., to Scherer Steel Co., Hartford; Bartlett & Brainard Co., Hartford, contractor.

100 tons, bridge, Elaine county, Montana, to Colorado Fuel & Iron Corp., Denver; Walter Mackin, contractor.

100 tons, viaduct, Fergus county, Montana, to Colorado Fuel & Iron Corp., Denver; Fred Dudley, contractor.

REINFORCING STEEL PENDING

1500 tons, housing projects, Windsor Locks, Conn.; Manchester, N. H., and Fairfield, Conn.

1500 tons, bars and piling, estimated, substructure, Ocean Terminal, Brookley Field, Mobile, Ala.; United Construction Co., Winona, Minn., low, $1,130,753, pro. 186, Oct. 8.

600 tons, four buildings, Rath Packing Co., Waterloo, Iowa; W. A. Klinger Inc., Sioux City, Iowa, low on general contract; bids Oct. 9.

575 tons, including 400 tons bars and 175 tons wire mesh, also 300 tons steel joists, Frances Cabrini homes, Chicago, for Chicago Housing Authority; S. N. Nielson Co., Chicago, low on general contract; bids Oct. 15.

500 tons, warehouses, navy yard, Portsmouth, N. H.

375 tons, for Kentucky highway bridge, Carrollton, Ky.; Missouri Valley Bridge & Iron Co., Leavenworth, Kans., low bidder.

350 tons, for Ampere substation; bids to Bonneville Power Administration, Portland, Oreg., Oct. 15.

300 tons, mesh and bars, state highway project, route 28, section 22, Hunterdon county, New Jersey; bids Oct. 31, Trenton, N. J.

150 tons, addition, naval prison, Portsmouth, N. H.; taking bids.

100 tons, research laboratory, Standard Oil Co. of Indiana, Whiting, Ind.; bids Oct. 20.

Unstated, $300,000 addition to navy hospital, Puget Sound navy yard; bids to Capt. R. E. Thomas, Oct. 29.

DAMASCUS

Manganese and Alloy STEEL CASTINGS

FROM ½ TO 1,000 POUNDS

Produced in our modernly equipped foundry from electric furnace steel and heat-treated in automatically controlled gas-fired furnaces.

We are in position to manufacture specialties made of manganese and alloy steel castings and invite concerns to write us about their requirements.

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DAMASCUS STEEL CASTING CO.
NEW BRIGHTON, PA.
(PITTSBURGH DISTRICT)

Pig Iron

Pig Iron Prices, Page 98

Pig iron priorities are working well after two months experience and production is being distributed

CONCRETE BARS COMPARED

	Tons
Week ended Oct. 18	11,103
Week ended Oct. 11	7,720
Week ended Oct. 4	14,051
This week, 1940	15,934
Weekly average, 1941	14,631
Weekly average, 1940	8,814
Weekly average, Sept., 1941	34,025
Total to date, 1940	405,772
Total to date, 1941	614,493

Includes awards of 100 tons or more.

more equitably. Melters with defense orders have been served adequately, although they are unable to accumulate reserves. Assurance of sufficient supply as needed has given an easier feeling and less pressure is exerted on suppliers to increase shipments. Existence of the pool from which emergency tonnage can be ordered out contributes further to this situation.

The current method of distribution has had the effect of bringing large inventories into immediate use, thereby releasing new iron for other users. A result has been almost complete absence of curtailments or shutdowns.

Melters are doing better in filing their requirements before the fifth of the month preceding, thus making the work of producers lighter in formulating allotments in advance.

As a complementary raw material scrap supply has a strong effect on pig iron and effect of priority on scrap is being watched closely. With better distribution of available scrap some pressure for pig iron may be relieved. In this case more iron will be available to foundries without defense work and may be allocated in a way to relieve unemployment in cases where foundries otherwise might be shut down.

Scrap

Scrap Prices, Page 100

Some improvement in the steel and iron scrap situation is developing and in several districts better supply has appeared, though the gain is not marked. Some of this gain is from tonnage previously held back for higher prices and now released before the new priority system reveals its presence through inventory report. Shipments by barge from the Southwest have relieved the situation somewhat along the Ohio river, allowing idle open hearths to resume.

The St. Louis district has been receiving considerable remote scrap released by the recent higher prices. This material is said to have been assembled and ready to ship as soon as better prices could be obtained. With St. Louis and Chicago avidly absorbing material coming from the West little from beyond the Mississippi is available for shipment to Ohio and Pennsylvania, except from Texas and Oklahoma. Both these states have been closely combed for scrap in recent months.

Reclamation of scrap from automobile graveyards, undertaken with much enthusiasm a month ago, has not yielded the expected tonnage and relatively little has been made available.

OPA has amended the scrap schedule to include railroad grades in the Cincinnati district, prices being the same as for other Southern Ohio points.

Some good effects have been observed from the priority order, though it is too soon to evaluate its full effect. An eastern Pennsylvania steelmaker faced with curtailment of open-hearth activity obtained aid from Washington, dealers being instructed to rush shipments and scrap from the Philadelphia navy yard being sent to the mill. This aid is temporary and the threat of shortened operation continues unless the process can be continued.

The next few weeks is expected to demonstrate whether scrap supplies simply are too small to meet demand or whether better distribution will solve the difficulty. It appears that buying and selling will go on as usual under the priority order, except that OPM will order

Tool Steel Scrap

Cents per pound, to consumers f.o.b. shipping point

Tungsten Types

For each 1% tungsten contained

Solid scrap containing over 12%	1.80c
Solid scrap containing 5 to 12%	1.60
Turnings, millings containing over 12%	1.40
Turnings, millings, solids under 5%	1.25

Molybdenum Types

Solid scrap, not less than 7% molybdenum, 0.50 vanadium	12.50
Turnings, millings, same basis	10.50
Solid scrap, not less than 3% molybdenum, 4% tungsten, 0.50 vanadium	13.50
Turnings, millings, same basis	11.50

Handling FERROMANGANESE from cars to stock pile this Blaw-Knox Bucket unloads an average of 7 cars per eight hour shift. The former cost of $.65 per ton was *reduced* to $.25 per ton.

This bucket handles LIMESTONE in pieces ranging from 6" to 12" from dock to 50-60 ton gondola, filling car in an average time of 20 minutes.

It unloads SPIEGEL from 50-60 ton car in 1½ hours without teeth, and handles PIG IRON from stock pile at the rate of about ¾ Cu. Yds. per grab.

Blaw-Knox Buckets are designed to meet Steel Mill requirements—put your bucket problems up to Blaw-Knox.

BLAW-KNOX
Digging and Rehandling
BUCKETS
BLAW-KNOX DIVISION
• OF BLAW-KNOX CO. •
Farmers Bank Bldg. · Pittsburgh, Pa.

emergency shipments from time to time to meet individual needs.

A foundry at Muskegon, Mich., proposes erection of a 500-ton blast furnace to supply iron for its defense work, shortage of scrap being a strong factor.

A disquieting phase of the general scrap situation is lack of reserves for winter consumption as collection and shipment in cold weather always are severely curtailed. Few melters have stockpiles of any size at present.

Warehouse

Warehouse Prices, Page 99

Results of warehouse efforts to obtain steel under the quotas allowed by OPM run fairly parallel with the general market situation. While some material is being supplied under the A-9 priority, this preference is too low to give much relief, although the situation in general is better. Plates are most difficult to obtain. Much less than quota tonnages are available in hot-rolled bars, while cold-rolled are somewhat easier, though many popular sizes are almost unobtainable. Prospects in hot and cold-rolled sheets are better than average and it is possible full quotas may be obtained. Galvanized sheets are in better supply.

Stocks are small, in some cases as low as six weeks, compared with usual inventories for eight months.

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for ELECTROPLATING, POLISHING AND ANODIZING INFORMATION

For prompt, dependable metal finishing information, call on Udylite. No organization is better equipped to give you information gained from installing plating, polishing and anodizing departments in many leading manufacturing plants throughout the country.

Trained plating engineers and electrochemists are at your service. These men *know* metal finishing and they can help you plan a new installation or revise your present one for greater efficiency. They know, also, that you want information quickly.

Udylite has a complete line of equipment . . . second to none in terms of quality and efficient performance.

and supplies . . . for every metal finishing need. Salts, acids, anodes, buffing and polishing materials—everything required. Call Udylite for prompt service on your finishing requirements. You pay no more for Udylite dependability.

1 Laboratory where efficiency of Udylite finishing processes is maintained by constant control. 2 Design and layout department where clients may obtain the advice of experienced metal finishing engineers. 3 Laboratory where all Udylite products are tested under actual plant conditions.

THE UDYLITE CORPORATION

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New York 60 E. 42nd Street | Chicago 1943 Walnut Street | Cleveland 3756 Carnegie Ave.

Pacific Coast

Seattle—Priorities have sharply reduced demand for steel items and many private projects are being postponed until the emergency has passed. Rolling mills and fabricating shops have more than they can handle in defense items and are struggling to reduce backlogs.

New regulations seem to be working more smoothly as industrialists become familiar with requirements. Compliance is noted on request for sub-contracting and many small machine and tool shops have ample work. Priorities do not seem to have adversely affected non-defense industries in this area. However, there is complaint from lumbermen, especially loggers, who report difficulty in obtaining tractors, donkey engines, trucks and trailers vitally essential to operation. Lumber mills in Washington and Oregon in September were at 108.1 per cent of estimated capacity.

Important bids called include construction of the Fort Peck, Montana, powerhouse, tenders to United States engineer, Kansas City, Mo., Nov. 21, tonnages unstated.

Defense officials are placing orders for cast iron pipe and similar goods from day to day but many important municipal projects are being delayed due to inability to obtain priorities.

The scrap market is unchanged, cast scrap being increasingly scarce while receipts of steel scrap are greatly reduced, due to diversion to the East of materials from Montana and other territory normally adjacent to the Coast. Mills still have fair inventories but unless there is an adjustment, plants in this area may soon face a shortage.

Canada

Toronto, Ont.—Diversified steel orders are offered Canada's primary producers and despite record-breaking production, output is more than 30 per cent below war requirements. To correct this the Canadian Steel Controller is asking co-operation of consumers not engaged in war production, has placed restrictions on a number of civilian commodities and is negotiating for increased imports from the United States.

Supply of ship plates and special alloy armor plate falls far short of meeting requirements and shipbuilding activities, particularly in British Columbia, have been reduced by slow delivery of steel. The government is increasing production of tanks to provide its quota of 100 for Russia, for which further tonnage of armor plate is required.

Fresh orders for sheets are received for war production and Canadian mills are well behind in meeting needs. Output has been fully covered to the year end and mills now are out of the market, taking only orders from government sources.

Heavy demand persists for mer-

chant bars and practically all new business accepted is that approved by the steel controller. On small lots for fill-in sizes mills still are accepting orders, but without definite delivery dates.

Structural steel lettings were more prominent last week, totaling close to 15,000 tons, while prospective awards in connection with new war projects total about 20,000 tons.

Demand for merchant pig iron is gaining rapidly and while production of foundry and malleable has been increased there is still a substantial shortage of these grades.

Sponsored by the Department of Munitions and Supply, special efforts are now being directed toward increasing supply of ferrous scrap materials. The government has taken over control of scrap produced in war plants, but otherwise has not interfered with dealers in their sources of supply. Little scrap is coming from the country and dealers that formerly brought in big tonnages by truck from remote sections find little opportunity to pick up supplies in the country. Steel scrap is in fair supply, but offerings are dropping rapidly. Cast scrap is scarce and demand far exceeds supply.

Tin Plate

Tin Plate Prices, Page 96

Continuing priority orders for tin plate are heavy. Mills are still busy on monthly shipments of allocated tin plate for Great Britain placed in May and still constituting a large backlog. The total order was for 270,000 tons. Current orders all carry preference numbers.

Tin supply no longer is a problem but sufficient steel for producing black plate for tinning is difficult to obtain and varies from week to week as other demands absorb the semifinished steel.

Iron Ore

Iron Ore Prices, Page 99

Lake Superior iron ore movement in 1941 has passed the all-time season record of 65,204,600 gross tons made in 1929, the high point being reached Friday, Oct. 10. Interruption to movement through the locks at Sault Ste. Marie by collapse of a bridge is estimated to have cost the season's total about 500,000 tons, but with usual weather for the remainder of navigation it is believed a total of more than 79,000,000 tons will be moved. This will be a gain of nearly 14,000,000 tons over the previous high record.

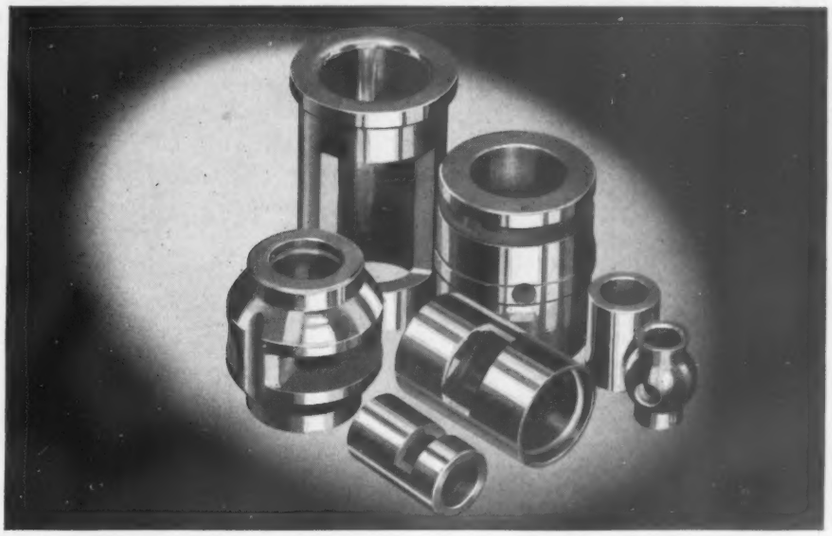
Steel in Europe

Foreign Steel Prices, Page 99

London—(*By Cable*)—Steel and iron activities in Great Britain continue to expand, concentrating on war material. Civilian and export business is extremely limited. Demand is quiet for structurals, medium sheets, wrought iron and tin plate, which are less important for the war effort. Coke, ore and semi-finished are in good supply with reserves in hand. Fourth quarter steel for tin plate has been reduced a further 15 per cent.

Equipment

Seattle—Automotive equipment and road machinery are in active demand by public agencies, recent bids calling for a number of units. King county, Washington, is considering tenders for 34 pieces, 27 bids offered. Bids were opened Oct. 14 for five four-wheel trucks for Ampere substation. Portland Motors is low, $12,712 to same agency for furnishing six flat-bed trucks, and Four Wheel Drive Auto Co., Clintonville, Wis., is low, $14,700, for four-wheel drive trucks. Same office has called bids Oct. 21 for lightning arresters, No. 2312, Oct. 22 for insulated cable, No. 2290, and station service cubicle, $2311. Harnischfeger Corp., Milwaukee, has installed seven overhead traveling cranes at Puget Sound Navy yard. Tacoma has awarded Allis-Chalmers Mfg. Co., Milwaukee, a contract at $15,841, for seven circuit breakers for tideflats substation. California Wire Cloth Corp., Seattle, has an army award at $17,791, for furnishing woven wire fence for Portland-Columbia airport.



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New Catalogue

Just issued, lists and describes the most complete sleeve bearing service in the world. It's Free.

At no other time, in the history of our country, has it been so important to insist on QUALITY. The present continuous and uninterrupted operating schedules are placing unusual burdens on all types of machinery. Few items in your equipment carry such responsibility as the bearings. One faulty bearing can easily hold up an entire line of production. This is no time to experiment with unknown, untried, unproven products.

It is a simple matter to eliminate all risk when securing bearings. Specify JOHNSON BRONZE. For more than thirty years we have specialized on the production of QUALITY Sleeve bearings. Our experiences cover every known type . . . our facilities include every proven method.

The next time you purchase bearings, don't base your judgment on price alone. Check up on the alloy, the method of production, the experience and reputation of the manufacturer. Play safe and specify JOHNSON BRONZE.

JOHNSON BRONZE
Sleeve BEARING HEADQUARTERS
550 S. MILL STREET • NEW CASTLE, PA.

Nonferrous Metal Prices

Oct.	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
1-8	12.00	12.12½	11.75	52.00	52.00	5.85	5.70	7.25	15.00	14.00	35.00
9-17	12.00	12.12½	11.75	52.00	52.00	5.85	5.70	8.25	15.00	14.00	35.00

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 12.00c Conn. copper

Sheets

Yellow brass (high)	19.48
Copper, hot rolled	20.87
Lead, cut to jobbers	9.10
Zinc, 100 lb. base	13.50

Tubes

High yellow brass	22.23
Seamless copper	21.37

Rods

High yellow brass	13.01
Copper, hot rolled	17.37

Anodes

Copper, untrimmed	18.12

Wire

Yellow brass (high)	19.73

OLD METALS

Dealers' Buying Prices

No. 1 Composition Red Brass

New York	10.00-10.25
Cleveland	10.50-10.75
Chicago	10.25-10.50
St. Louis	10.50

Heavy Copper and Wire

New York, No. 1	10.00
Cleveland, No. 1	10.00-10.50
Chicago, No. 1	10.00
St. Louis	10.00

Composition Brass Turnings

New York	9.25-9.50

Light Copper

New York	8.00
Cleveland	8.00-8.50
Chicago	8.00
St. Louis	8.00

Light Brass

Cleveland	6.00-6.25
Chicago	6.00-6.25
St. Louis	6.25

Lead

New York	5.25
Cleveland	5.00-5.25
Chicago	4.75-5.00
St. Louis	4.75-5.00

Old Zinc

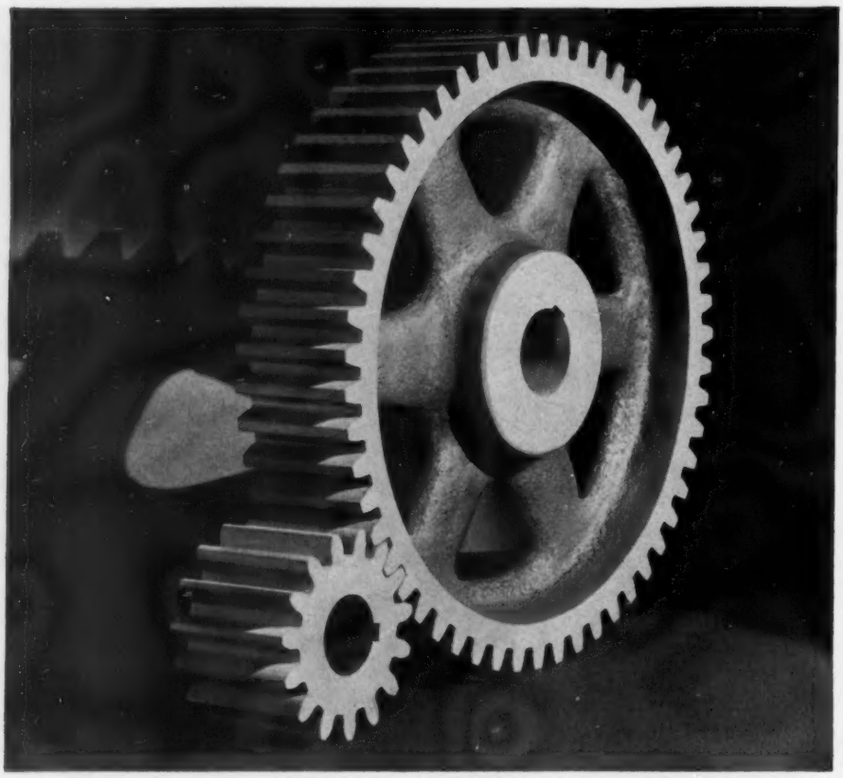
New York	4.50
Cleveland	4.00-4.12½
St. Louis	4.50-5.00

Aluminum

Mis., cast	11.00
Borings, No. 12	9.50
Other than No. 12	10.00
Clips, pure	13.00

SECONDARY METALS

Brass ingot, 85-5-5-5, l. c. l.	13.25
Standard No. 12 aluminum	16.00



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☆ Horsburgh & Scott Gears are rugged and dependable for industry's hardest tasks . . . gears that stand supreme in quality of materials and in workmanship . . . and here are three of the reasons why: 1. Patterns designed for strength. 2. Accurate machining and cutting to specifications. 3. Finest materials used . . . for example, unless otherwise specified, steel gears are made from .40 carbon steel which has a higher tensile strength and wears much longer than commonly used .15 - .20 carbon steel.

Send note on Company Letterhead for 488-Page Catalog 41

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND, OHIO, U. S. A.

Nonferrous Metals

New York—Priorities Division of OPM is taking punitive action against violators of priority regulations and has ordered all aluminum operations of the Central Patern & Foundry Co. of Chicago, save those on defense oders, shut down until March 31. Like action is expected to be taken soon against other violators.

Copper—Refined copper stocks dropped to a new low of 63,670 tons as deliveries, including domestic and foreign refined metal, rose to 120,429 tons. Defense authorities have raised their estimate of probable 1942 military and essential civilian copper consumption to 1,600,000 which would leave only about 200,000 tons for civilian use. Lend-Lease Administration will buy high-cost copper at prices above the 12-cent level for export to England, China and Russia.

Lead—Supplies are getting tighter steadily but defense demand is not as pressing as it is in aluminum and copper.

Zinc—A new OPA order covering secondary zinc and zinc scrap prices is pending. Producers of rolled products made a further revision in prices to comply with OPA wishes.

Tin—Offerings remained light as Far Eastern tin held at about 52.25c, weighed-up New York, compared with the ceiling 52-cent level.

Activities of Steel Users, Makers

■ AMPCO METAL INC., Milwaukee, has plans for construction of a machine shop addition, 120 x 120 feet, and a forge shop addition, 100 x 100 feet. Work will start this fall, and $250,000 has been authorized to construct and equip the new projects.

♦

J. Lee Hackett Co., Detroit, has removed its office and factory to 1061 East Milwaukee avenue.

♦

H & P Mfg. Co., Cleveland, has moved its office and plant from 1635 East Fifty-fifth street to 13945 Triskett road.

♦

Acme Aluminum Foundry Co., Chicago, has acquired a plot of land, 125 x 125 feet, adjacent to its brass plant, to be used later for an addition.

♦

L. J. White Co., Chicago, has changed its name to Kelite Products Inc. No change in management or personnel is involved, and operations continue at 315 West Hubbard street.

♦

American Chemical Paint Co. has completed construction of a new alkali plant in Ambler, Pa., and after Oct. 25 activities of its Tidewater Division at Newcastle, Del., will be transferred to Ambler.

♦

Pittsburgh sales office of Lukens Steel Co., By-Products Steel Corp. and Lukenweld Inc. has been closed and communications are to be addressed to the general sales offices at Coatesville, Pa.

♦

Littelfuse Inc., Chicago, maker of small electrical fuses and fuse mountings for instruments, aircraft, radio, etc., is erecting a plant at El Monte, Calif., containing 21,000 square feet of floor space, to be in operation Nov. 1.

♦

Pheoll Mfg. Co., manufacturer of screws, Chicago, has purchased an additional plant and property at 5650 West Roosevelt road. The acquisition includes ground 376 x 1254 feet with a one-story building, now under lease to W. D. Allen Mfg. Co., maker of industrial supplies.

♦

Corporate name of Hydrocarbon Chemical & Rubber Co., Akron, O., jointly owned enterprise of B. F. Goodrich Co. and Phillips Petroleum Co. has been changed to Hycar Chemical Co. The company recently was designated by the Defense Plant Corp. to build and operate a synthetic rubber plant at Louisville, Ky. The plant to be erected at cost of $2,750,000 under lease arrangement with the government agency will have capacity of 10,000 long tons yearly.

♦

Pocket-size booklet, latest in a series of "Know Your Company" publications, was distributed to 10,000 employes last week by Revere Copper & Brass Inc., New York. Purpose of the booklets is to familiarize employes with various aspects of the company's activities. Separate illustrated sections are devoted to products, location of mills and district sales offices, business organization and manufacturing.

♦

Kent-Owens Machine Co., Toledo, O., has appointed Eccles & Davies Machinery Co., Los Angeles, agent in that territory for its power milling machines, and C. F. Bulotti Machinery Co., San Francisco, exclusive agent in that territory.

♦

Roller-Smith Co., Bethlehem, Pa., reports Electrical Jobber Equipment Co., 501 Fourth avenue, South, Minneapolis, has been appointed agent for the following territory: Minne-

THE GREATEST SINGLE OBSTACLE TO THE MACHINE AGE . . . . THE HORNY HAND OF FRICTION!

As long as lubrication is acting, friction is tamed, but when lubrication is suspended or fails, the damage due to friction wrecks machinery. The function of a bearing metal is purely to prevent, or minimize, this damage caused by the failure of lubrication. The value of a bearing metal, therefore, is in direct ratio to its ability to eliminate, or reduce, the wear or damage which follows a suspension of lubrication. The intelligent selection of a babbitt is of utmost importance, and we are always ready to help you in this connection.

A. W. CADMAN MFG. CO.

PITTSBURGH, PENNSYLVANIA

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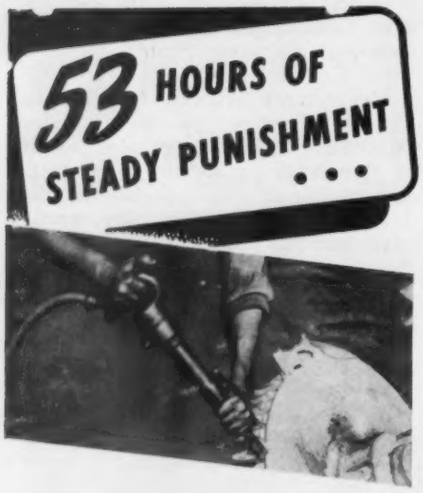

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■ That's the record set by this BISCO Tool Steel chisel, chipping burrs from rough castings.

Such service records are typical of BISCO Tool Steels. Each bar is thoroughly inspected to insure greatest durability when subjected to the most severe service conditions found in industry. We carry a large range of standard size Tool Steel for chisels for hand or pneumatic work, either in bar stock, blanks, or finished ready for use.

Consult us for further information or advice on your special needs on any steel product.

ANOTHER TIME SAVER

TOOL STEEL TUBING

Conserve time, manpower and machine-power with BISCO Tool Steel Tubing, and save expensive steel wasted through milling solid bars. BISCO Tubing is stocked up to 12" O.D. When cut to your exact specifications, it is ready for immediate use as ring dies, spacers, bushings, etc.

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sota, North Dakota, South Dakota, and that part of Wisconsin west of a line between La Crosse and Ashland.

♦

Keystone Carbon Co. has completed an addition to its factory in Saint Marys, Pa., for the manufacture of brushes and porous bronze bearings, and has also laid the foundation for another plant addition to house new equipment for making negative temperature coefficient resistors.

♦

Lakeside Steel Improvement Co., Cleveland, recently was awarded honorable mention by the Cleveland Chamber of Commerce for the architectural beauty and engineering efficiency of its new plant. Warner & Swasey Co. and Cleveland Pneumatic Tool Co. were similarly honored with bronze plaques as a result of the chamber's annual survey.

♦

Stoler & Curll Inc., Philadelphia, has changed its name to Vulcan Corp., with the following personnel: President and treasurer, H. E. Curll; vice president, secretary and sales manager, A. H. Kruger; chief engineer, B. G. Tarkington.

♦

Vulcan Corp. recently acquired all patents, patterns, etc. of the furnace division of Philadelphia Drying Machinery Co.

Predict 11.8% Carloadings Rise in Fourth Quarter

■ Freight car requirements for 29 principal commodities in the fourth quarter are estimated at 7,052,638, according to the Regional Shippers' Advisory Boards' national forecast. This compared with actual requirements of 6,307,278 cars in the corresponding period in 1940, and represents an 11.8 per cent increase.

Iron and steel, it is reported, will require 603,687 cars, up 12.1 per cent from 538,375 in the quarter last year; machinery and boilers, 43,599 cars, an increase of 23.9 per cent from 35,198. Freight car requirements for automobiles, trucks and parts in the period are estimated at 188,181, down 14.6 per cent from 220,245 cars; for agricultural implements and vehicles, other than automobiles, estimate for fourth quarter, 1941, is 24,501 cars. This is 29.9 per cent greater than actual requirements totaling 18,856 in the quarter last year.

Coal and coke movement by rail will necessitate an estimated 2,312,320 cars, up 14.9 per cent from 2,012,439 cars in the final three months in 1940. Ore and concentrates will require 579,965 cars, against 512,673, a rise of 13.1 per cent.

August Manganese Ore Output, Shipments High

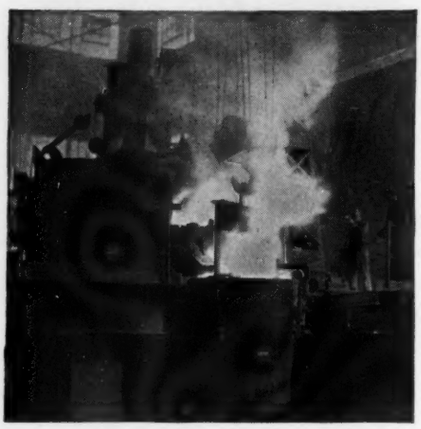
■ Domestic production of manganese ore containing 35 per cent or more manganese in August was 9100 gross tons shipments were 9000 tons and producers' stocks at the end of the month 1200 tons, according to the Bureau of Mines. In July production was 6000 tons, shipments 6200 tons and producers stocks at the end of the month were 1100 tons. Shipments averaged 3344 tons per month in 1940, with the annual total 40 123 tons.

Imports for consumption in July

NF

BASIC ELECTRIC STEEL

FORGINGS



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Die Blocks & Piston Rods

NATIONAL FORGE AND ORDNANCE COMPANY

IRVINE, WARREN COUNTY, PENNA.

totaled 65,871 tons, containing 31,389 tons of manganese. General imports in July were 65,381 tons, containing 31,141 tons of manganese.

Contract Opportunities

(*Concluded from Page 46*)

pounds. QR-30; bids Oct. 28.

8963—Strapping, packing case, steel, Grade I, Type A. QR-35,000 and 43,000; bids Oct. 30.

Bidding forms on any of these schedules should be obtained by wiring, mentioning schedule number, to the War Department, Air Corps, Material Division, Office of Contracting Officer, Wright Field, Dayton, O. QR refers to quantity required.

42-524—Rectifier alternating current generators. QR-4; bids Nov. 14.

42-707—Roller bearings, heavy duty and cone type. QR-large; bids Oct. 30.

42-805—Heaters and hotplates, electric. QR-259 and 500; bids Oct. 23.

42-797—Machine, hardness testing. QR-61; bids Oct. 23.

42-814—Gage assembly, pressure. QR-2400; bids Oct. 23.

Defense Corp. Reports More Lease Agreements

■ War Department recently announced more lease agreements have been completed between Defense Plant Corp. and manufacturers for establishment of new facilities or increase in existing equipment for production of items essential to the army. Title to all facilities purchased and installed in accordance with the agreements will be retained by Defense Plant Corp. Agreements, approved by Office of Production Management, are as follows:

Pullman-Standard Car Mfg. Co., Chicago, $285,152 increase for acquiring, rehabilitating and equipping with machinery a plant at or near Chicago for production of aircraft parts. Total of lease agreement now is $1,394,053.

Barnes, W. F. & John, Co., Rockford, Ill., $2,000,000 for acquiring site, constructing and equipping a building thereon for manufacture of shells.

Kellett Autogiro Corp., Philadelphia, $95,957 for acquisition of additional machinery and equipment to be used in existing plant for manufacture of airplane parts.

Canada's War Orders $38,525,586 in Week

TORONTO, ONT.

■ Contracts placed by Canada's Department of Munitions and Supply in the week ended Sept. 30 totaled $38,525,586. Orders placed with companies in United States comprised $264,057. Aircraft awards, with total value $17,546,385, topped the list; shipbuilding orders aggregated $9,535,217; construction and defense projects, $6,385,300. The orders:

Aircraft: Canadian Car & Foundry Ltd., Montreal, $17,496,000; Aviation Electric Ltd., Montreal, $13,090; Fleet Aircraft Co. Ltd., Ft. Erie, Ont., $26,584.

Shipbuilding: Grand Trunk Pacific, Montreal, $8,035,200; Gordon Boat Works, Bobcaygeon, Ont., $7300; Canadian Dredge & Dock Ltd., Toronto, $19,169; Wm. Kennedy Ltd., Owen Sound, $6228; Westminster Iron Works Ltd., New Westminster, B. C., $280,800; Heaps Engineering Ltd., Vancouver, B. C., $624,920; Letson & Burpee Ltd., Vancouver, $226,800; Progressive Engineering Works, Vancouver, $140,400; Consolidated Engines & Machines Ltd., Victoria, $194,400.

Land Transport: Ford Motor Co. of Canada Ltd., Windsor, Ont., $87,199.

Instruments: H. R. Biland, Montreal, Que., $18,800; McGill university, Montreal, $5000; Consolidated Optical Co. Ltd., Ottawa, Ont., $9376; Research Enterprises Ltd., Leaside, (Toronto), $223,841; Ingram & Bell Ltd., Toronto, $5671.

Electrical Equipment: Joseph A. Likely Ltd., St. John, N. B., $8667; R.C.A. Victor Co. Ltd., Montreal, $18,345; Northern Electric Co. Ltd., Ottawa, $284,259; Canadian National Carbon Co. Ltd., Toronto, $5566; Crouse-Hinds Co. of Canada Ltd., Toronto, $20,512.

Machinery: Sicard Ltd., Montreal, $129,600.

Fire Fighting Equipment: Walter Kidde Co. Ltd., Montreal, $5816; Empyre Fire Extinguisher Corp., Ottawa, Ont., $6715.

Munitions: Canadian Industries Ltd., Montreal, Que., $19,256; Renfrew Electric & Refrigerator Co. Ltd., Renfrew, Ont., $47,834; Alberta Foundry & Machine Co., Ltd., Medicine Hat, Alta., $330,000.

War Construction Projects: Douglas Bremner Construction Co., Montreal, Que., $87,000; E. G. M. Cape Co. Ltd., Montreal, $204,595; E. J. Ryan Construction Co., Montreal, $203,654; P. McGuaig Ltd., Montreal, $66,800; Acadia Construction Co., Halifax, N. S., $80,000; Canadian Dredge & Dock Ltd., Toronto, Ont., $457,639; Milne & Nicholls Ltd., Toronto, $480,000; Geo. W. Porter Construction Co. Ltd., Toronto, $114,942; A. W. Robertson Co. Ltd., Toronto, $776,760; Bird Construction Co. Ltd., Winnipeg, Man., $60?,602; P. W. Graham Ltd., Moose Jaw, Sask., $503,677; Smith Bros. & Wilson Ltd., Regina, $514,277; Piggott Construction Co., Saskatoon, $51,554; Soquist Construction Co., Saskatoon, $530,106; Poole Construction Co. Ltd., Edmonton, Alta., $322,000; H. B. Macdonald & Co., Edmonton, $800,000.

Miscellaneous: Richards-Wilcox Canadian Co. Ltd., London, Ont., $13,282; Canadian Comstock Co. Ltd., Toronto, $8650; Kelvinator of Canada Ltd., London, $6556; Wm. Kennedy Ltd., Owen Sound, $8952; Power Bros. Ltd., Lunenburg, N. S., $6000; Cotter Bros. Ltd., Winnipeg, Man., $13,000; Poole Construction Co. Ltd., Edmonton, Alta., $35,000.

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Construction and Enterprise

Ohio

CAMDEN, O.—Village, Lloyd Townsley, mayor, is negotiating bond sale to finance municipal light and power plant costing about $101,000. Will include building 34 x 74 feet, three diesel engines and distribution system.

CLEVELAND — Globe Machine & Stamping Co., R. S. Geddes, president, 1250 West Seventy-sixth street, plans a one-story addition costing $40,000. E. McGeorge and W. R. Hargett, 9400 Quincy avenue, are engineers.

CLEVELAND—Apex Electric Mfg. Co., J. L. Thomas, company engineer, 1070 East 152nd street, is taking bids on a one-story 145 x 325-foot plant addition to cost about $125,000. (Noted Oct. 13.)

CLEVELAND—Black Boring & Machine Co., 4909 Luther avenue, J. Meyers, superintendent, will build a two-story 80 x 100-foot plant and office building, contract let to Charles E. Lewis & Son, 1200 Green road, South Euclid, at about $40,000. J. W. Thomas, 3868 Carnegie avenue, architect.

CLEVELAND—Tube Craft Inc., J. W. Held, president, 1328 West Seventy-eighth street, has let contract to Bolton-Pratt Co., 1276 West Third street, at about $40,000, for a one-story 43 x 105-foot plant. (Noted Aug. 25.)

CLEVELAND—Cleveland Wire Spring Co., 1281 East Thirty-eighth street, plans erection of a sheet metal plant at East Forty-ninth street and Harvard avenue. James W. Campbell is president-treasurer.

CANTON, O.—Berger Mfg. Co., division of Republic Steel Corp., 1038 Belden avenue, has started expansion of manufacturing facilities to cost over $125,000.

CLEVELAND—Colonial Iron Works Co., 17643 St. Clair avenue, Lionel M. Stern, president, is enlarging its plant.

CLEVELAND — Wellman Bronze & Aluminum Co., 2525 East Ninety-third street, has received grant of $110,072 additional, making total grant $302,293, for enlarging facilities for production of magnesium castings.

ELYRIA, O.—Ridge Tool Co., North Ridgeville, O., is high bidder for buildings and land of Bender Body Co., sold at auction. Company had planned erection of new plant, but if this sale is confirmed will use Bender plant. Carl H. Ingwer is president of Ridge Tool Co.

GALLIPOLIS, O.—Buckeye Electric Cooperative Inc., John R. Lusher, superintendent, has funds allotted by REA for power distributing station at Sciotoville, O., or Rutland, O., for energizing Jackson county lines, to cost about $250,000. Previous allotment of $329,000 was for 323 miles of rural lines to serve 1185 members.

STEUBENVILLE, O.—City, Eugene C. Boyd, service director, will have a survey made of practicability of municipal electric light and power plant to cost $1,250,000.

WARREN, O.—Copperweld Steel Co. has plans for increasing its capacity for production of alloy steel by 66,000 tons and has offered this to OPM. Would probably be financed by Defense Plants Corp.

WASHINGTON COURT HOUSE, O.—Furnace Foundry Co., Troy T. Junk, attorney, has been incorporated to build a foundry plant on site furnished by local businessmen at cost of $20,000. Leo P. Fedigan is plant superintendent.

Maryland

BALTIMORE—Consolidated Gas, Electric Light & Power Co. of Baltimore, Lexington building, will build an electric generating plant, including 90 x 103-foot turbine room, 88 x 107-foot boilerhouse, 90 x 103-foot service building, including 67,000-horsepower generator, at Patapsco avenue and Sparrows Point railway, buildings to cost $40,000, equipment $4,000,000. (Noted April 21.)

New York

NEW YORK—American Iron Products Corp. has been incorporated with 200 shares no par value to manufacture and deal in metal products, by Francis C.

Additional Construction and Enterprise leads may be found in the list of Shapes Pending on page 105 and Reinforcing Bars Pending on page 106 in this issue.

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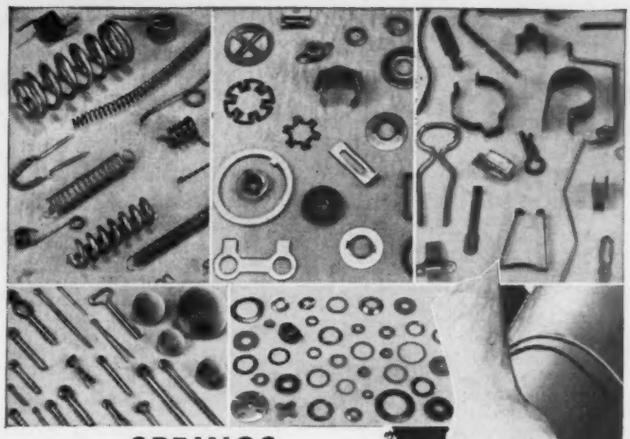

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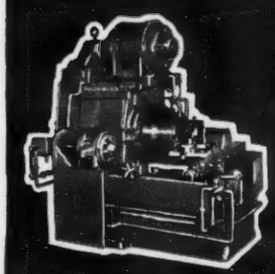

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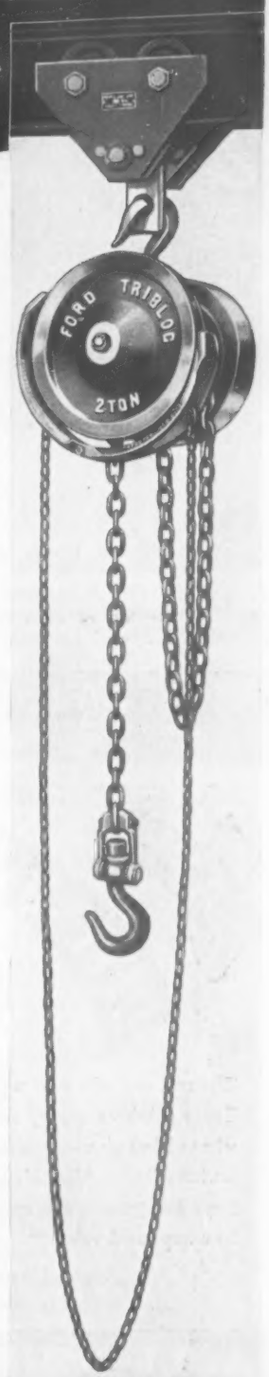

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New Jersey

NEWARK, N. J.—Purolator Products Inc., 365 Frelinghuysen avenue, will let contract soon for a one-story 100 x 155-foot top addition to its oil filter factory, to cost about $90,000. William Newman & Sons, 587 Summitt avenue, Jersey City, N. J., are architects.

POMPTON LAKES, N. J.—E. I. du Pont de Nemours & Co., 71 Buckingham place, Perth Amboy, N. J., will build a two-story 64 x 86-foot chemical building and one-story 34 x 146-foot locker building on Cannonball road, contract to Eastern Construction Co., 705 Greenwood avenue, Trenton, N. J.

RIDGEFIELD, N. J.—Superior Marking Machine Co., 451 Lispenard street, New York, will build a plant on 200 x 200-foot site on Grand avenue, costing about $50,000.

Pennsylvania

ALIQUIPPA, PA.—National Can Corp., S. L. Buschman, president, 110 East Forty-second street, New York, has let contract for a one-story 150 x 300-foot warehouse, to Brown & Matthews Inc., 122 East Forty-second street, New York, at about $350,000.

MIDLAND, PA.—Socony Vacuum Oil Co., McKees Rocks, Pa., has received permit and will build petroleum unloading dock on Ohio river, including steel bulk storage tanks, pipe lines and facilities for unloading barged petroleum products, on five-acre tract.

Michigan

DETROIT—Standard Reamer & Tool Co., 2620 Elmwood street, has let contract to Austin Co., for design and erection of a one-story machine shop at Ferndale, Mich., a suburb, to cost about $40,000.

DETROIT—Arrow Tool & Reamer Co. has let contract to Trowell Construction Co., Detroit, for an addition to its plant.

FENTON, MICH.—Dery Machine & Tool Co., 403 South Leroy street, has been incorporated with $5000 capital to deal in tools, dies and jigs, by John H. Dery Jr., Fenton.

FERNDALE, MICH.—Superior Tool & Die Co. will build a plant on Hilton avenue for its wholly-owned subsidiary, Standard Reamer & Tool Co., covering 10,000 square feet, to cost $30,000. The Austin Co. has the contract.

GRAND RAPIDS, MICH.—Jarecki Machine & Tool Co., is having plans prepared by Robinson, Campau & Crowe, architects, Grand Rapids, for a plant addition.

GRAND RAPIDS, MICH.—Keeler Brass Co. has let contract to Osterink Construction Co., Grand Rapids, for a warehouse addition.

LANSING, MICH. — General Motors Corp., Detroit, has let contract to Francis J. Corr & Son, Lansing, for an addition to the plant of its Olds Motor Works division.

PONTIAC, MICH.—Yellow Truck & Coach Mfg. Co. is having plans made for a machine shop addition costing about $50,000.

STURGIS, MICH. — Frank L. Shoemaker, Sturgis, has been given contract for an addition to Dock's Foundry, Three Rivers, Mich.

Illinois

AURORA, ILL. — Independent Pneumatic Tool Co., 753 Claim street, is having plans drawn for a plant addition to cost about $40,000.

EAST ST. LOUIS, ILL.—Illinois-Missouri Scrap Steel Baling Co., F. G. Tuschman, Fort Wayne, Ind., manager, is establishing a steel scrap preparing plant, with 150-ton baling press, overhead cranes, conveyors, railroad scales and power plant. Will reduce automotive scrap to bales for steel plant use.

GRANITE CITY, ILL.—Commonwealth Steel Co., subsidiary of General Steel Castings Corp., Eddystone, Pa., G. Fred Driemeyer, works manager, will build an addition costing $14,000,000 for production of cast armor plate for army tanks, financed by Defense Plants Corp. Land and buildings are estimated to cost $3,208,000 and equipment $10,731,000.

Minnesota

ST. PAUL—Minneapolis-Moline Power Implement Co. is remodeling 142 x 534-foot plant at 3200 Como avenue for shell manufacture.

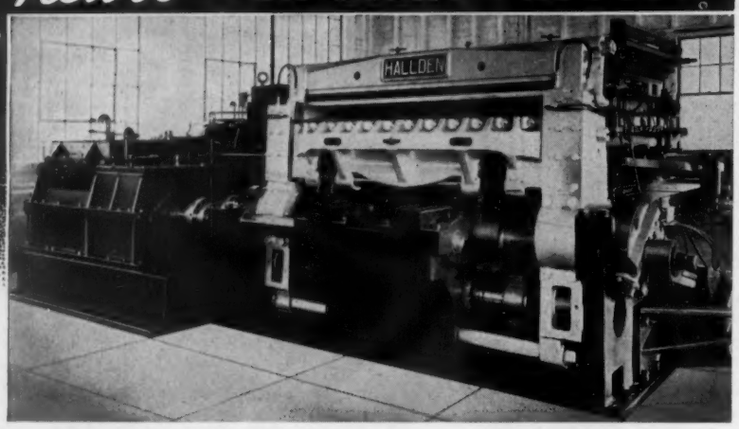
Texas

ARLINGTON, TEX.—Southern Ornamental Iron Works has been given loan of $75,000 by Reconstruction Finance Corp.

AUSTIN, TEX.—Union Potash Co., subsidiary of International Agricultural Co., New York, will build magnesium plant near Austin for refining magnesium, to cost about $9,063,000; plant for extraction of dolomite ore, $1,660,000. Will use power from Colorado river. To be financed by Defense Plant Corp.

FREEPORT, TEX. — Defense Plant Corp. will spend more than $52,000,000 for plant to extract magnesium from Gulf

Shears FOR EVERY PRODUCT



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water, to be operated by Dow Chemical Co., with capacity of 72,000,000 pounds annually. This will raise capacity at Freeport to 108,000,000 pounds. A. P. Beutel is manager at Freeport.

HOUSTON, TEX. — General Metals Corp., Harold W. Schmid, vice president, plans $160,000 expansion, including one-story die shop and inspection department, 7200 square feet floor space; magnetic hardness inspection equipment; die shop; 4000-pound steam drop hammer.

HOUSTON, TEX.—Long Reach Machine Works, Long Reach, Tex., has asked priorities for $20,000 expansion of its plant.

Nebraska

GOTHENBURG, NEBR. — City plans construction of municipal electric light and power plant to cost about $45,000, with equipment. A. Weideranders is city engineer.

Iowa

LOGAN, IOWA—City, C. L. Strong, mayor, plans installation of municipal power plant and distribution system to cost about $45,000. (Noted Oct. 13.)

California

LOS ANGELES—Security Engineering Corp., 108 West Whittier boulevard, is building a machine shop 50 x 173 feet, to cost $16,000.

LOS ANGELES—Wire & Metal Mfg. Co., 5965 South Alcoa avenue, is building a plant addition 118 x 200 feet, to cost about $35,000.

STOCKTON, CALIF.—War department will build a motor repair shop costing $333,663 at the Stockton fourth echelon air base.

Oregon

PORTLAND, OREG.—Oregon Electric Steel Rolling Mills, recently incorporated, is seeking site for $1,000,000 plant. Morris Schnitzer is president.

Washington

SEATTLE — Associated Shipbuilders, 2751 Sixteenth avenue S. W., will build sheet metal shop addition 60 x 80 feet.

SEATTLE—Star Machinery Co., 207 Horton street, is making additions and improvements to its machine shop and warehouse.

SPOKANE, WASH.—Army plans $500,000 munitions dump with concrete igloos at Geiger Field.

TACOMA, WASH.—Pierce county fire district No. 2 will take bids Nov. 3 for first unit of $403,000 Lakewood water system project, to be awarded in four contracts, involving three wells, elevated steel storage tanks, turbine pumps, mains and hydrants. Parker & Hill, Seattle, are engineers.

Canada

PORT MELLON, B. C.—Sorg Pulp Co., Vancouver, B. C., has let general contract to Dominion Construction Co., 509 Richards street, Vancouver, for plant addition here, including machine shop, to cost $95,000, without equipment.

WINNIPEG, MAN.—S. & S. Aircraft Ltd., 215 Watt street, will build plant addition to cost $90,000, without equipment, and has given general contract to H. E. Gibson & Co., 631 Strathcona street.

BRANTFORD, ONT.—Canadian Durex Abrasives Ltd., 154 Pearl street, Toronto, Ont., is receiving bids through Prack & Prack, architects, 36 James street South, Hamilton, Ont., for a plant addition to cost about $300,000 with equipment.

CHATHAM, ONT.—Chrysler Corp. of Canada Ltd., Tecumseh road, Windsor, Ont., has given general contract for $150,000 plant addition here to Carter Halls Aldinger Co. Ltd., 419 Cherry street, Toronto, Ont.

HAMILTON, ONT.—Dominion Foundries & Steel Ltd., Depew street, will take bids through Prack & Prack, architects, 36 James street South, for a plant addition costing about $100,000.

HAMILTON, ONT.—Aerovox Canada Ltd., 43 Catharine street South, manufacturer of condensers and other electrical equipment, will build a plant addition costing $75,000, with equipment. Hutton & Souter, 36 James street South, are architects.

OTTAWA, ONT.—General Motors Corp. of Canada Ltd., William street, is receiving bids through Allward & Gouinlock, architects, 57 Bloor street West, Toronto, Ont., for a plant addition costing about $250,000.

ST. THOMAS, ONT.—Weatherhead Co. of Canada Ltd., Talbot street, manufacturer of screws, bolts, etc., plans new plant on Redan street, to cost about $75,000, with equipment. N. Kilmer is superintendent.

MONTREAL, QUE.—Canadian Marconi Co. Ltd., 211 St. Sacrament street, manufacturer of electrical equipment, is having plans made by J. C. Meadowcroft, architect, 1154 Beaver Hall square, and will take bids soon for a plant addition at Mount Royal, to cost about $150,000, with equipment.

MONTREAL, QUE. — Johnson Wire Works, 4760 Dagenais street, is having plans made by T. Pringle & Son, 485 McGill street, and will call bids soon for an addition to cost about $60,000, with equipment.

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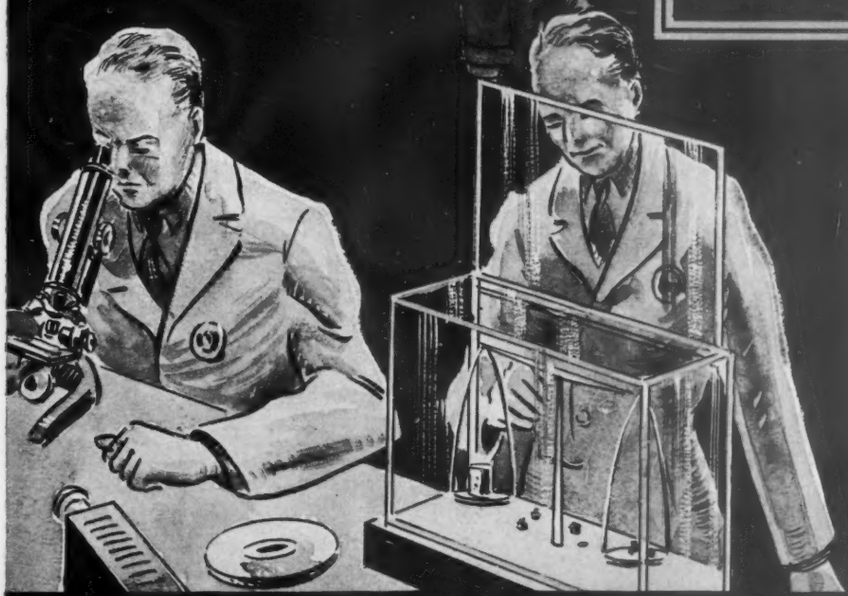

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Behind the Scenes with STEEL

The Advance Gang

■ You've never really been to a Metal Show unless you've been among the privileged few who show up anywhere from a day to a week before the opening, blessed with the honor of setting up their booths and displays. This great award was forced upon our thin shoulders again this year.

And again this year, in spite of all possible advance precautions, our booth was as bare as you-know-what when we arrived and we immediately joined the clamoring mob hunting their cases. And so the first half day is spent running all over town looking for a dozen big 500 lb. crates, but they always finally appear as mysteriously as they vanished and you and your lucky friends peel off your coats and start in to ruin your good suit, shoes and disposition.

Now, with time off for some serious haggling with the decorators, borrowing tools from the well-equipped booth across the aisle, and a couple of good knockdown-drag-out arguments with the electricians, the next stretch of hours is devoted to converting yourself into a carpenter, interior decorator, carpet layer, and plumber, none of which you know anything about.

Of course, after you've struggled with it day and night and just put on the finishing touches five minutes before the doors open, you more than likely will have developed a serious case of "boothitis," from which you will never fully recover, but it is really a very broadening experience you must try sometime.

A Great Show

■ The Metal Show this year, to our way of thinking, topped anything yet by far, and Bill Eisenman and his capable crew of cohorts certainly deserve a rousing hats off.

One could, and did, spend hours roaming the three great exhibition halls marveling not only at the impressive strength of American industry, but still more at the showmanship it has developed to display that strength.

And more than ever before, the Metal Show this year was a much better cross section of the industry, with many new faces and new products. The predominant theme, of course, was defense. You could see everything from the world's smallest nickel tubing (19/10,000 of an in.) to the largest Allison engine, you could experience a surprisingly realistic airplane raid, shoot "machine guns" at flying "pursuit planes," see any of a dozen remarkably good industrial movies, enjoy a complete marionette show, putt on a golf green, inspect an M-3 tank at close range, watch glass blowers, admire dozens of gorgeous Powers models, pick up pocketsful of souvenirs and gadgets, and at the same time get an impressive picture of the defense job being done by the metal industries.

It was a great show.

Bank Night

■ The best labor story we've heard in a long time has to do with a Minneapolis pump manufacturer who has been up to his ears in defense orders and has been having considerable difficulty getting his men to work much overtime on weekends. Under the union contract the men don't have to work more than 40 hours if they elect not to, and the company has been trying to get them to work as much as 56 hours, paying time and a half for overtime, of course.

Sundays were particularly bad, because only a handful of men would show up and they would have to shut down, so the management hit upon a clever scheme. Every Sunday is "Bank Night" and any employe working Sundays has a chance. His time card is dropped into a box and at the end of the day, three are pulled out. The first wins $50, the second, $30, and the third $20.

After this had gone on for a few weeks, and a large number of men had turned out each and every Sunday, one of the employes went to the local office of a government agency and complained the company was working the men to death. Upon questioning, he had to admit he didn't have to work Sundays, so the government man asked: "Then why do you keep it up if it's killing you?"

"Say," said the worker, "how do you think I can have any fun on Sundays when I knew doggone well that I'd win the fifty bucks if I was there?"

Good—Unquestionably

■ WHILE we're still reasonably close to the aluminum shortage, let's not forget the notice now being slapped on the neck of our favorite beer which formerly came all neatly poulticed in aluminum foil. The neck now says, "No More Aluminum Foil. Requisitioned for Defense Purposes. Same Quality". Ordinarily we would be incredulous, because we usually feel that reassurances in print that a substitute is just as good don't seem to set well. You just can't question anything with the name of defense, though, and the effects of the beer apparently are not impaired, because when we emerged from that air-conditioned bar the heat was less like an open hearth and more like a cookstove.

Numbered Days

■ Guests at the Hotel Statler, Buffalo, these days can while away some time very educationally inspecting the exhibits set up in the lobby by Bell Aircraft and Curtiss-Wright. The latter exhibit was gathered together at the last possible minute and consists of parts taken right off the production line. Their days are numbered because they have to be replaced and they are covered while on display with something over $50,000 worth of insurance.

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